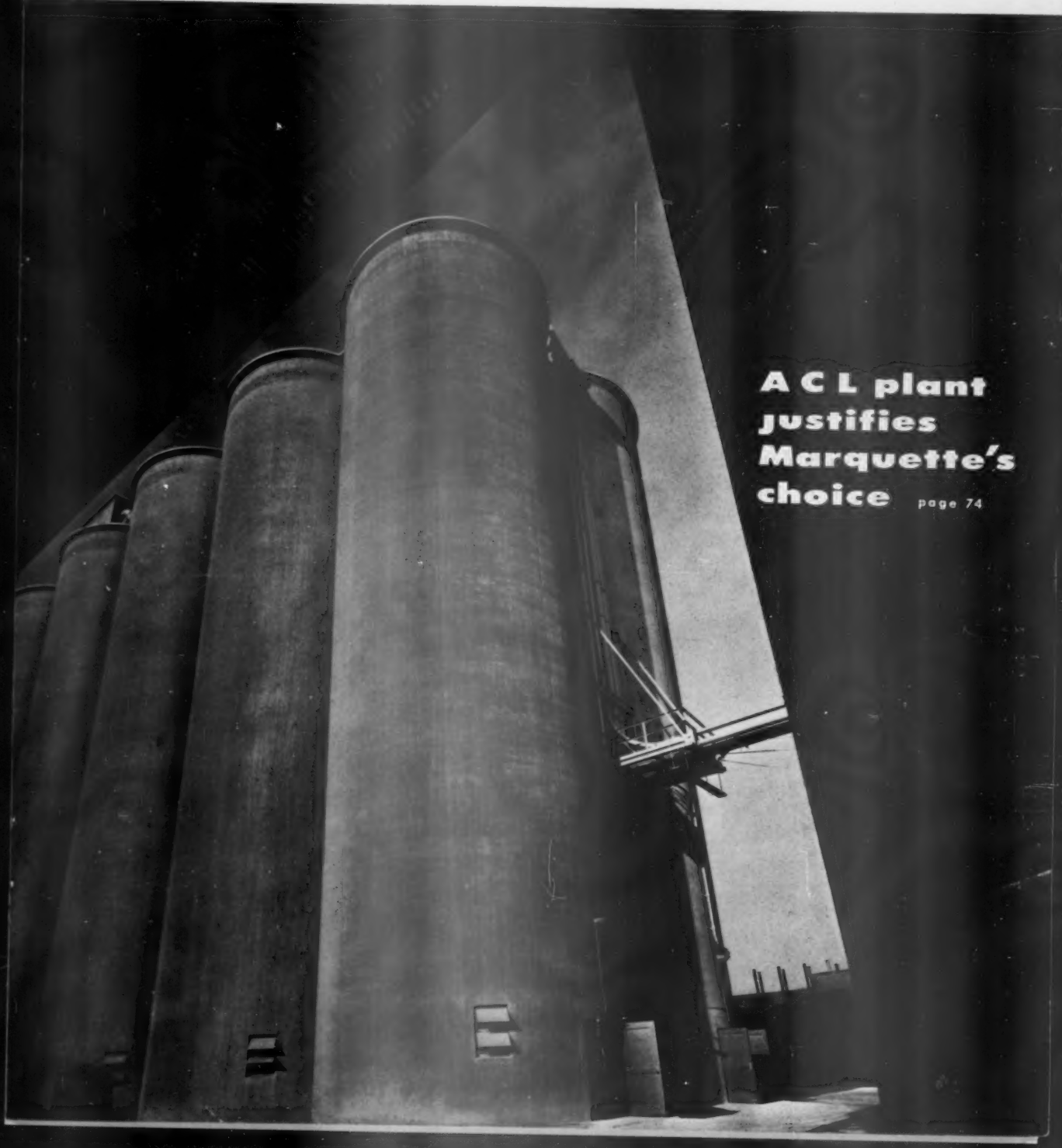
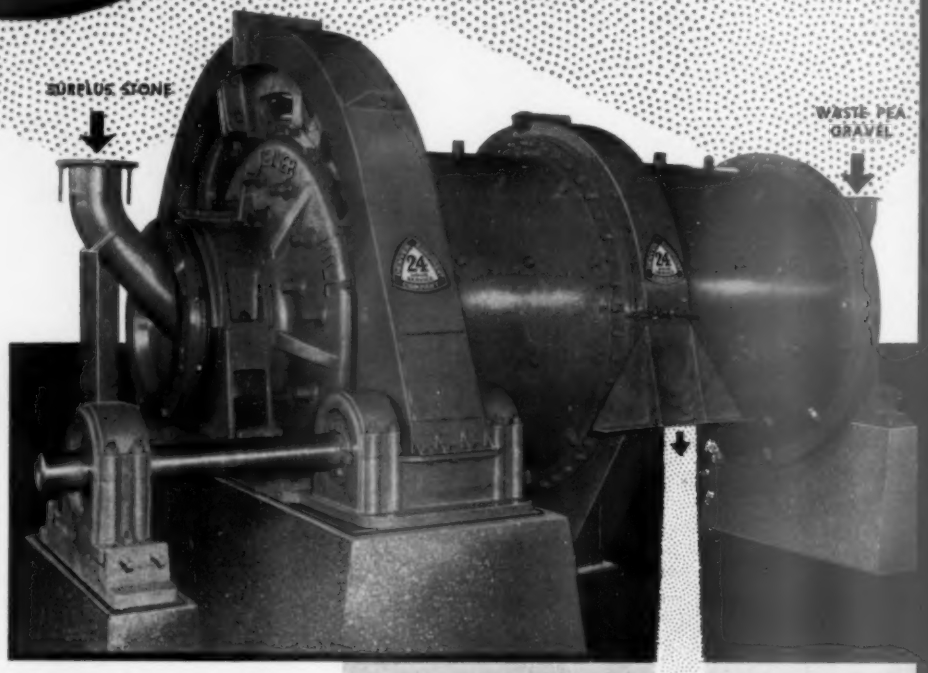
DECEMBER 1959

ROCK PRODUCTS



A C L plant justifies Marquette's choice page 74

DENVER Peripheral Discharge MILLS



turn waste stone and pea gravel into valuable specification sand...

—specification sand for concrete, mortar or asphalt—simple, quick, easy and profitable. You get a graded product that's sharp and clean—easy to blend with coarse sizes or sell, and worth many dollars of extra profits to you!

the first step is

DENVER SAND Grinding Test Service

—No Cost to You

Our testing laboratory is backed by more than 30 years of practical test and field experience. Actual sand grinding demonstrations will show you

- **—type and size grinding mill needed to produce desired tonnage.**
- **—proper size auxiliary equipment, such as classifier, pumps, etc.**

Tests eliminate risk of your specifying equipment too small to do the job or too large and costly for your needs. Preliminary tests are made without charge. Send ¼ yard sample of material prepaid to—

DENVER TESTING LABORATORY
1755 Blake Street—Denver, Colorado

Center Peripheral Discharge Denver Mill is shown above. Also End Peripheral, Grate Discharge and the Trunnion Overflow Mills available. Mill sizes (up to 10′ dia. x 20′ long) and types best suited for your grinding needs are described in Bulletin No. B2-B20.

$HARP, CLEAN
$PECIFICATION $AND

"The firm that makes its friends happier, healthier and wealthier"

DECO ENGINEERS — STANDARD RELIABLE 24 HOUR SERVICE EFFICIENT

DENVER EQUIPMENT COMPANY

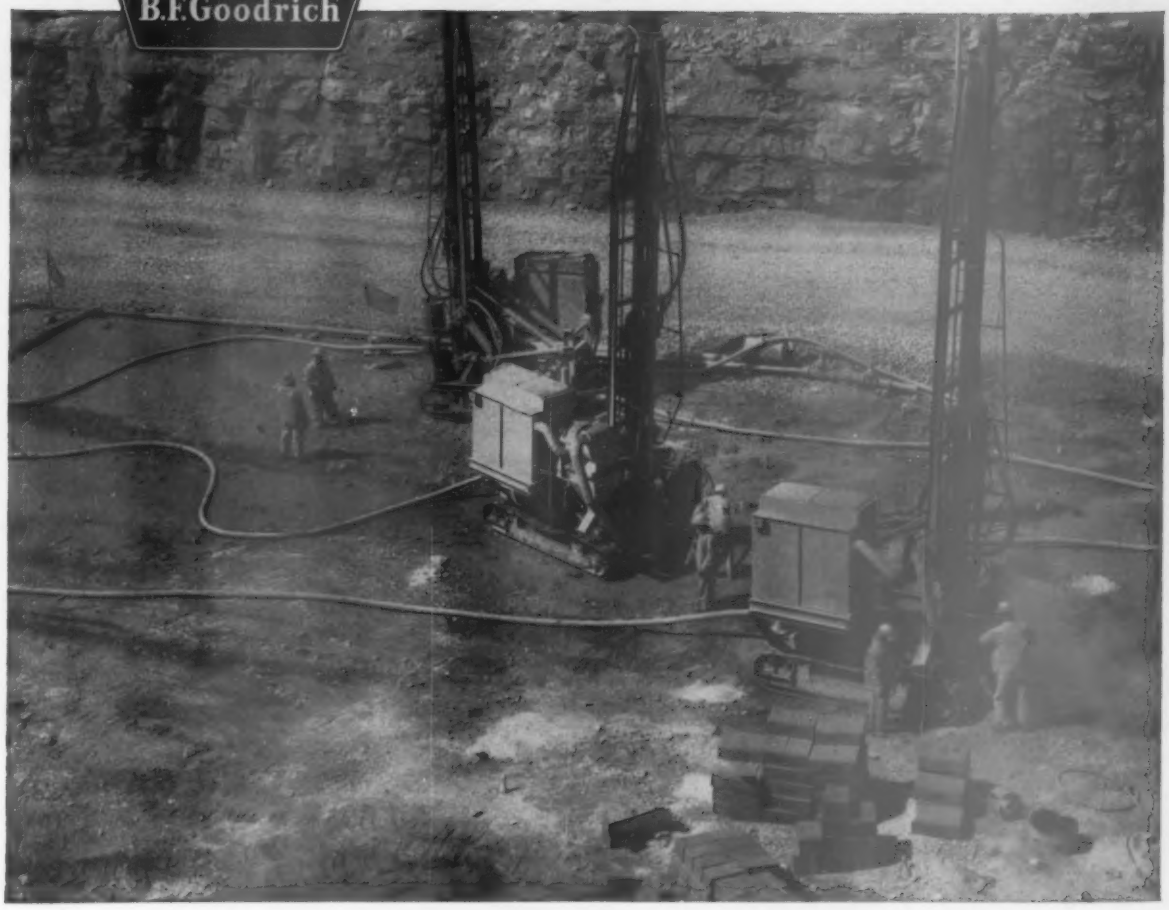
Cable DECO DENVER

Phone CHerry 4-4466

1400 Seventeenth St. Denver 17, Colorado

- **NEW YORK CITY**
  4114 Empire State Bldg.
  Phone CH 4-6510
- **BLUEFIELD, W. VA.**
  P.O. Box 1119 • Phone DAvenport 5-6598
- **TUCSON, ARIZ.**
  3437 E. Camden St. • Phone EAst 6-7282
- **LONDON**
  15-17 Christopher St., Finsbury Sq.
  Phone Bishopsgate 3575
- **JOHANNESBURG**
  Broadway and Ninth
  Bez Valley • Phone 25-7531
- **TORONTO**
  185 Bay Street
  Phone EMpire 3-8836
- **VANCOUVER**
  802 Credit Foncier Bldg.
  Phone MUtual 3-7595
- **MEXICO CITY**
  Avenida Juarez 14, Desp. 615
  Phone 21-1477
- **LIMA**
  Merquinerias 270
  Casilla 4950 • Phone 41887

B.F.Goodrich



Hose helps dig a ditch that will detour a river

B. F. Goodrich improvements in rubber brought extra savings

THOSE machines are drilling holes for dynamite charges to blast out rock. When the job is done, a mighty river will take a detour down this newly formed channel. Power for the machines comes from compressed air, carried by hose. But on jobs like this, rubber hose used to go to pieces in no time.

When heat from the compressor got into the hose, it would harden the rubber, breaking it into loose, gummy particles that clogged the machine, put it out of action.

B.F.Goodrich engineers went to work on the problem. By adding, subtracting and changing proportions of rubber, they found a special compound for the hose that stands heat without scorching or hardening.

Hose lined with this new rubber was made and put to work. On jobs where air hose used to go to pieces in weeks, B.F.Goodrich hose now lasts months, even years.

Thousands of feet of B.F.Goodrich air hose are in constant use on this job. It's been doing dozens of different jobs, and lasting longer doing them, even though it's dragged over rough, jagged rocks, soaked in water, sometimes battered by flying pieces of rock.

Your B. F. Goodrich distributor has the exact specifications for the B.F.Goodrich air hose described here. And, as a factory-trained specialist in rubber products he can answer your questions about all the rubber products B.F.Goodrich makes for industry. *B.F.Goodrich Industrial Products Co., Dept. M-745, Akron 18, Ohio.*

B.F.Goodrich ***industrial rubber products***

Enter 1206 on Reader Card

Enter 1205 on Reader Card

ROCK PRODUCTS

a Maclean-Hunter publication, Vol. 62, No. 12

December 1959

In this issue

Departments

ROCK PRODUCTS magazine is published monthly by Maclean-Hunter Publishing Corp., 79 W. Monroe St., Chicago 3, Ill.; P. D. Allen, President.

Second-class postage paid at Chicago, Ill. and at Long Prairie, Minn. *Subscription Information*—Subscription price: United States and possessions, Canada, one year, $3.00; two years, $4.00; three years, $5.00; U.S., single copy, 50¢. Pan-American, one year, $8.00; two years, $14.00; three years, $20.00; all other foreign, one year, $12.00; two years, $22.00; three years, $30.00; single copy, $1.00. Canadian subscriptions and remittance may be sent in Canadian funds to ROCK PRODUCTS, P. O. Box 100, Terminal "A," Toronto, Canada. *To subscribers*: Date on wrapper indicates issue with which your subscription expires. In writing to have address changed, give old as well as new address. ROCK PRODUCTS is indexed regularly by Engineering Index, Inc. and Industrial Arts Index.

TIRED OF THE SAME OLD GRIND?

Do a better job with added efficiency and economy with Coates Triple-Forged Carbex Grinding Balls. Production run tests show that job for job and dollar for dollar, Coates out-performs grinding balls costing many times more.

Coates Grinding Balls grind better, last longer and wear more evenly because they are carefully made of special formula fine-grained, high-carbon steel, checked and calibrated to be more perfectly round . . . scientifically heat treated to the very core, to be tough and rugged.

Call for Coates Triple-Forged Grinding Balls . . . built with care for longer wear.

Write for prices . . . All sizes—½″ to 5″ carried in stock for immediate shipment.

CS59-2

COATES STEEL PRODUCTS CO. CARBEX TRIPLE-FORGED BALLS

COATES

STEEL PRODUCTS COMPANY

GREENVILLE, ILLINOIS

LARGEST EXCLUSIVE MANUFACTURER OF GRINDING MEDIA

Enter 1287 on Reader Card

See this Demonstration!

Your Atlas Representative Can Show You Actual Performance of Unique Electric Match Contained Only in Atlas E.B. Caps

All Atlas Electric Blasting Caps are fired with tiny electric matches so dependable that the armed services use thousands of them in missiles and rockets.

You can prove for yourself how sure-fire Atlas caps really are. Your Atlas representative has an interesting test firing kit to show you. Pick a match at random from his stock and fire it yourself . . . see how it can be depended on to fire in your blast hole.

Your Atlas man can show you *why*, too. Every part of every Atlas match is pre-tested, and the match is completed by multiple dips in high quality flash compounds.

Your Atlas representative will be glad to show you this demonstration, and to help you use Rockmaster and regular Atlas E.B. Caps for dependable initiation and timing to get effective, economical blasting.

EXPLOSIVES DIVISION
ATLAS POWDER COMPANY
WILMINGTON 99, DELAWARE
Offices in principal cities

Write for your copy of the new 60-page Handbook of Electric Blasting by D. M. McFarland and Guy F. Rolland.

Enter 1207 on Reader Card

The 5th NORTHWEST for COURTNEY & PLUMMER is a 25-D 18-ton CRANE

HERE'S ANOTHER of the many Northwest 25-Ds that are going to work for gravel producers all over the Country. This is an 18-ton unit working for Courtney & Plummer of Neenah, Wis. It's the 5th Northwest this well-known Wisconsin company has bought—a testimonial in itself to Northwest performance.

Material Supply Yards everywhere are finding the Northwest 25-D outstanding as a ¾-yd. machine. Its smoothness of operation, its ease of handling, and its ease of maintenance put it far ahead of rigs of equal capacity. It makes available a group of advanced features found in no other similiar piece of equipment.

The new Northwest High Speed Worm Boom Hoist is controlled through Uniform Pressure Clutches. It is a *true* power up and power down boom hoist and can be locked in any position when desired. The 25-D has true Power Load Lowering. It brings you longer crawlers and larger drums with greater cable capacity. Drum brakes and clutches are larger. Uniform Pressure Swing Clutches are larger. An improved "Feather-Touch" Clutch Control gives still easier operation and Grouped Lubrication makes upkeep easier.

There is a lot more to tell about these and other Northwest advantages on this workhorse of the ¾-yd. field. Let a Northwest man bring you up to date. Available as Shovel, Standard Crane, Dragline and Pullshovel, of course.

NORTHWEST ENGINEERING COMPANY
135 South LaSalle Street, Chicago 3, Illinois

NORTHWEST

Always Ready to GO

NORTHWEST EQUIPMENT IS BUILT IN THE FOLLOWING SIZES

SHOVELS	CRANES	DRAGLINES	PULLSHOVELS	TRUCK CRANES
¾ Yd. to 2½ Yd. Capacity	13-Ton to 60-Ton Capacity	¾ Yd. to 3 Yd. Capacity	¾ Yd. to 2½ Yd. Capacity	25-Ton to 35-Ton Capacity

D-443

built to keep you in aggregate . . . at a profit

DIAMOND PORTABLE *Rotor-Lift* CRUSHING PLANTS

Diamond makes everything for the production of aggregate

Portable and stationary crushing plants
Jaw crushers
Roll crushers
Vibrating screens
Scalping and scrubbing screens
Drag washers
Conveyors
Plate feeders
Apron feeders
Grizzlies
Bins and hoppers

Diamond has the equipment, experience, manufacturing facilities and distributor set-up to handle any size job to your satisfaction. Try them.

Enter 1261 on Reader Card

When you can turn out 300 to 400 tons of road gravel per hour in 25% to 35% crush, you're in a good profit position. That's what Diamond Portable Plants are doing in locations all over the country. Here's how and why—

- **line-flo system moves material through plant without delay—no extra scalpers, no by-passes, no bottlenecks.**
- **rotor-lift recirculates material fast, distributes it without batching or bunching on feed conveyor.**
- **long jaw design of jaw crusher handles the hardest of rock, gives maximum size uniformity.**
- **high speed roll crusher steps up output by eliminating reruns through jaw crusher, has high capacity for its weight, requires low h.p. per ton produced.**
- **balanced vibrating screen does thorough job of separating materials without clogging, can be depended upon for long, trouble-free service.**
- **belt conveyors run on antifriction bearings, move material quickly and smoothly.**

Add to these advantages complete portability in the pit or on the road without costly delay, and a choice of drives to best suit your conditions. It's easy then to see why companies that base their profit on aggregate production ability turn to Diamond when starting a new operation or expanding an existing one. Check with your Diamond distributor.

DIAMOND IRON WORKS
DIVISION
GOODMAN MANUFACTURING COMPANY
Halsted Street and 48th Place • Chicago 9, Illinois

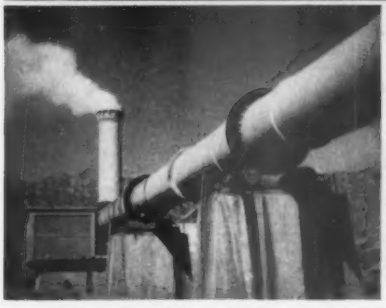
Traylor-made kilns *feature*

Operating Economy
Advance Design
Rugged Dependability

GYRATORY CRUSHERS • JAW CRUSHERS
Traylor
ROTARY KILNS • BALL MILLS • APRON FEEDERS

10′–0″ diameter x 340′–0″ Traylor Rotary Kiln in a Portland Cement plant.

Traylor engineers have built hundreds of Rotary Kilns now being used in industry throughout the world. Traylor kiln shells are fabricated with quality steel plate. The full-floating type of tire with special mounting holding the tire in place—but permitting it to float free of the shell as it contracts and expands is another reason why Traylor Kilns are your best buy. For details, ask for Traylor Bulletin No. 1115.



8′-0″ x 150′-0″ Rotary Kiln in a portland cement plant.

9′-6″ dia. x 250′-0″ Rotary Kiln in a portland cement plant.

12′-0″ x 325′-0″ Rotary Kiln in a chemical plant.

TRAYLOR ENGINEERING & MFG. CO.

1404 MILL ST., ALLENTOWN, PA.

Sales Offices: New York — Chicago — San Francisco

Canadian Mfr.: Canadian Vickers, Ltd., Montreal, P.Q.

See our display at the Chem-Show booth #495 New York Coliseum, Nov. 30 to Dec. 4

Enter 1204 on Reader Card

NOW...you get no-turn shuttle-hauling

2-WAY CONTROLS — Operator always faces direction of travel . . . swings around *without leaving seat.* Pivoting seat with 2-way controls lets him operate with equal ease, comfort, safety in either direction. These unique features plus Dumptor's equal speeds in both directions eliminate need for turning at the loader . . . on the haul road . . . or at the dumping area.

2 WAYS TO DUMP — During *instantaneous gravity dump* . . . operator releases fast by-pass of fluid in hydraulic cylinders . . . gravity takes over . . . dumps load instantly. Or, operator can apply *controlled gravity dump.* Hydraulic system acts as a retarder. Gravity actually tilts the body . . . hydraulic pressure controls the rate of discharge.

in a BIG 15-TON Koehring® Dumptor®...

. . with dual controls, pivoting seat, 24 mph speeds in both directions

- **Two steering wheels, throttles, brake pedals . . . one each located at *both* operating positions of *pivoting* seat.**
- **Directional travel and speed-range lever, and dump controls, centrally-located for 2-way operation.**
- **Speed range selections up to 24 m.p.h. in either direction controlled by easy-acting hydraulic clutches.**
- **Constant-mesh transmission with smooth torque converter drive . . . hydraulic power steering.**
- **2 ways to dump — *instantaneous* gravity dump . . . or *controlled* gravity dump with hydraulic cylinders.**
- **30,000-lb. payload capacity . . . 28.5% gradability . . . big, safe, 4-wheel airbrakes, plus parking brake.**

See for yourself how this big 15-ton Dumptor, with its unique shuttle haul advantage, can profitably boost output in your open pit, or underground mine. Call your Koehring distributor for a demonstration . . . do it today!

2 SIZES — In addition to the new 15-ton, Koehring builds a smaller, companion model 8-ton Dumptor (above). It has a ton of strength for every ton of payload capacity . . . 6 H.P. for every ton of loaded weight . . . 3-speed travel in both directions . . . 1-second dump . . . many other cost-cutting advantages for heavy-duty off-road hauling. Put Koehring Dumptor on your work.

LOAD WITH KOEHRING — Get lowest costs on hauling, stripping, loading . . . team Dumptors with Koehring heavy-duty shovels. ½-yard 205 is shown above. Other sizes up to 3-yards . . . including high-lift stripping shovels. Fully convertible to clamshell, dragline, lift cranes. Also check sensational new Koehring Skooper — free-swinging, full-revolving, 2-yard loader.

Enter 1284 on Reader Card

WHAT'S HAPPENING

IN OTHER FIELDS OF INTEREST TO THE ROCK PRODUCTS INDUSTRY

December, 1959

A vast untapped reservoir of nitrogen has been discovered in the soil. Agrologists at the University of Illinois find that clay particles in most soils have trapped an ammonium radical, a form of nitrogen. This discovery provides clues to the nature of nitrogen in rocks and meteorites. But more important, it points the way to new fields of research in agronomy, geology and biology.

Rosie the Riveter will be gone forever if aircraft makers perfect methods of glueing planes together. Modern fighter planes and domestic airliners already use hundreds of pounds of organic adhesives, but the limitations of greater heat, speed and vibration will reduce their usefulness. A number of chemical companies are working hard to develop ceramic adhesives which will bond the parts of tomorrow's supersonic aircraft. Problems: seeing that the brittle ceramics stand up under impact and vibration; maintaining high-strength bonds at high temperatures, and making an adhesive with the same coefficient of expansion as stainless steel, aluminum or other structural metals.

Sewage treatment takes a great leap forward with the commercial development of a new process for handling industrial and residential wastes. The "atomized suspension technique," a development of the Pulp and Paper Research Institute of Canada, is having its first full-scale testing this year. Under pilot plant and small scale testing, the AST process was an outstanding success to handle paper mill wastes, pickle liquors and the effluent from residential areas.

Salvage operations on World War II hulks are swinging into high gear. A Miami company, Isthmus Steamship & Salvage Co., plans to mine the ores contained in more than 40 ships which were sunk in relatively shallow waters. They anticipate that more than $75 million worth of chrome, molybdenum, manganese and uranium ores can be recovered economically from freighters sent to the bottom during the war years.

Molasses is used as a blasting agent. The Anaconda Co. reports that molasses makes a superior dense and sensitive blasting compound when added to fertilizer grade ammonium nitrate. A small amount of water makes the syrup liquid enough to penetrate the nitrate readily, and the mixture sticks to the hygroscopic salt. Actually, molasses is more than half carbohydrate; it apparently provides more available carbon to the reaction in smaller space at less cost than conventional petroleum-base mixtures.

New techniques of highway construction are still in the news. Streets and highways in Germany are being built with precast concrete slabs, according to CONCRETE PRODUCTS. Each rectangular concrete section ranges from 5 to 8 ft., depending upon the width and length of the roadway. The base is prepared by spreading a layer of gravel and a layer of sand, with the slabs vibrated into the wetted sand. The sections are wedged together and the crevices filled with sand. In this country, expansion joints between concrete slabs are now fitted with accordion-pleated rubber "sandwiches". Each rubber diaphragm is designed to expand and contract internally, without affecting the height of the joint. This will eliminate the familiar bumps in highways when sealing compounds are forced out of slab joints during the heat of summer.

Nothing is sacred to chemists—not even the mystery of what makes good beer. Gas chromatography now detects the ingredients in beer which affect its taste, alcohol content and keeping qualities. A Milwaukee brewery is using this technique to analyze the minute amounts of volatile compounds which appear in every stage of brewing. Eventually, they hope to be able to make consistently uniform—and good—beer without the extensive filtering, blending and coloring steps now in wide use.

The botanist has made a contribution to highway safety. Several state highway departments have found that the Multiflora rose is an effective crash barrier. Tests show that a mature stand of this bush will stop a car going 50 mph. within 75 ft. of impact without brakes. This will be good news to those states whose turnpikes and multilane highways produce a large number of accidents where cars cross into opposing lanes at high speed. The long, tough canes of this bush spread widely and thickly, intertwining to form a dense, resilient hedge. Only drawback to its extensive use is its inability to flourish in many areas.

"Take a radio instead of a pill," may be the doctor's advice to patients in the near future. Pill-sized radios can be built using tunnel diodes, a device far smaller than a transistor yet as powerful. When the small transmitter is swallowed, it will be able to send signals from different parts of the digestive system which will let doctors diagnose disturbances there. The use of diodes in other instruments will bring about complete miniaturization of transistorized equipment which is already very small. Needed next: An instrument to keep track of the tiny instruments.

Nuclear devices are finding new jobs on the nation's railroads. The New York Central is using a gamma ray counter to test the soundness of its wooden ties. This counter measures the amount of radiation reflected from a rail tie when subjected to a stream of rays from a radioactive source. Strong, dense ties reflect a portion of the weak rays; weak or rotten ties have little or no reflection. The counter has a meter which permits the operator to determine if the tie has deteriorated enough to be replaced. The Denver & Rio Grande Western research group has discovered that nuclear radiation can make dense "hardwood" out of softwood. Apparently fibers in the wood form cross-fiber linkage as an effect of ray bombardment. This strengthens the timber and gives it hardwood characteristics.

The editors

EDITORIAL

by GEORGE C. LINDSAY

1960 — Another record year?

IT ISN'T HARD to project another record year of output for the rock products industry in 1960, if you're even a little bit optimistic, and there's every reason you should be.

Total output should top 1.4 billion tons next year. That figure would set a new production record—about double what it was 10 short years ago.

The price tag on production in 1960 will exceed $3 billion. Total sales of that size should promise a continuance of record expenditures the last two years for plant, machinery and supplies. Spending may reach $333 million, a new high industry record.

Here are a few reasons for continued optimism in the economy next year; they'll be reflected in the rock products industry:

(1) The economy will experience a fillip as it tries to make up for lost time caused by the steel strike.

(2) There'll be a need for further inventory build-up, especially during the first half.

(3) Total construction should exceed 1959's estimated record of $54.7 billion. Expected increases in private non-residential, municipal and state, and public building will provide the push. Even though the highway building program may run a little behind the original projection for 1960, the impact on our industry will continue massive. Even residential construction will not be down as much as formerly expected.

(4) Producers recognize a need to improve plant and product. They will invest the required capital to do so, to better their competitive position.

A few warning signs to watch include:

(1) The labor situation. Outcome of the steel disaster is not finally determined. There may be a general railroad strike. Successful bargaining before deadlines would reduce adverse effects on the economy.

(2) Tight money. There are several "ifs" about this, since available supply of money and credit is controllable.

(3) Continued inflation. It will not run away, that's sure. It may "creep" a little, depending on what labor and management do at the bargaining table.

But the factors for continued growth are strong and are expected to overshadow combating forces. Record output and sales figures are indicated for the rock products industry in 1960.

WHYTE STRAND
Wire Rope is made for a purpose...

To give you the right rope for your equipment, each Whyte Strand wire rope is internally lubricated and designed to provide the right combination of toughness, flexibility, and abrasion resistance to assure maximum service.

Because Macwhyte manufactures a thousand and one wire ropes, you can be sure of getting just the right rope for each piece of your equipment.

You get quick delivery, too, from conveniently located Macwhyte distributors' stocks. For best results, ask for recommendations for the correct wire rope to use on your equipment!

MACWHYTE Wire Rope

Wire Rope made for a purpose—to serve you better

MACWHYTE WIRE ROPE COMPANY • 2900 Fourteenth Avenue • Kenosha, Wisconsin

Manufacturers of cableway excavator rope, shovel and dragline rope, haulage rope, derrick rope, scraper and dozer rope.

168

ROCKY'S NOTES

by NATHAN C. ROCKWOOD

Interesting and useful text on geology

WE HAVE ALWAYS REGARDED the industries served by this journal as more or less "applied geology." Therefore we have been interested in new textbooks on geology, and have reviewed several on this page in recent years. At last we have found one that should prove both helpful and interesting to promoters and operators in the rock products industries. It is: Basic Geology for Science & Engineering,* by E. C. Dapples, professor of geology, Northwestern University.

The evolution in the science of geology could hardly be better defined than by our author in his Introduction, quoting as follows: "In its early period of growth, geology was an academic science and its many practical applications were scarcely apparent. As the industrial revolution progressed, the demand for mineral raw materials placed emphasis on their discovery and exploitation, and transfer of the science into the applied field was accomplished. In this connection the most spectacular use has been the amazing pace of the continued discovery of new oil fields, but the location of deposits of metallic ores and nonmetallic materials is equally important though less publicized. Geology has contributed in an important way to knowledge in other sciences. Such contributions could be elaborated, but of concern to us herein is its application to the solution of problems arising from the physical conditions near the earth's surface."

Thus the book develops information of direct application to the various fields of science and engineering which, so far as our knowledge goes, is not obtainable in any other single volume. This fact is best summarized by the table of contents as follows: Soil Materials; Physical and Chemical Properties of Rock Materials; Rock-Forming Minerals; Igneous Rocks; Soil-Forming Processes; Ground Water; Wind Deposits; Processes Associated with Glaciation; Sedimentary Rocks; Crustal Deformation; Metamorphism; Tables for Determination of Common Minerals.

If we take up some of these subjects with a few suggestions as to their application to the rock products industries, we believe the reader can obtain a fair appraisal of the value of this textbook to the work in which he is engaged. For example, since commercial sand and gravel are "soil materials," it is obvious that a broad general knowledge of how they are formed and where to look for certain kinds of them is a matter of vital interest. In this chapter also are tables of typical systems of classification of particle size. For example, suppose there is an argument over specifications as to whether certain fines in sand are "silt" or "clay." Here is authority on the technical differences. To be sure, such distinctions are arbitrary but may, on occasion, be helpful to operators.

Again, in the prospecting of a sand and gravel deposit, it may be desirable to define the qualitative bulk physical properties, such as "clayey gravel," "sandy clay," etc. When such definitions are once definitely established (as they could be by using this text and charts), with understanding by both operators and process machinery manufacturers, a great deal would be accomplished in clarifying the literature of the industry. In the same chapter are various ways of determining and expressing size distribution of samples.

The chapter on physical and chemical properties of rock materials includes, as all modern textbooks must, the physical-chemistry of solid matter. The description of the origin and character of crystal systems is particularly clear and helpful for the uninitiated. Any real knowledge of geology must include an understanding of the organization of crystals, but not necessarily a comprehensive knowledge of crystallography.

Please turn to page 119

*Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N.Y., 1959, price $9.50.

Get the most out of your drills with JOY TC BITS

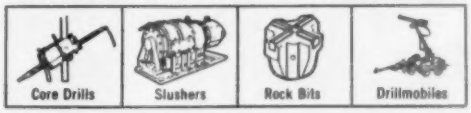
You get more footage per shift out of any drill when you use Joy Tungsten Carbide Bits. Here's why . . .

Joy bit blanks are precision machined from fine alloy steel, and controlled heat treating adds strength to give long life. The carbide inserts, made from special grades selected for their extra footage-producing ability, are brazed to the bit blank by an exclusive process. This provides an unsurpassed bond between the carbides and the bit blanks—there are no lost carbides with Joy bits.

These features, plus the hole-cleaning ability resulting from deep slot chipway design, keep Joy bits drilling longer. You get more hole per bit, and more hole per shift—maximum output from your drills.

For proof of performance, contact your Joy representative. He will be glad to demonstrate Joy Tungsten Carbide Bits. For more information, ask for Bulletin 364-27.

EQUIPMENT FOR MINING . . . FOR ALL INDUSTRY



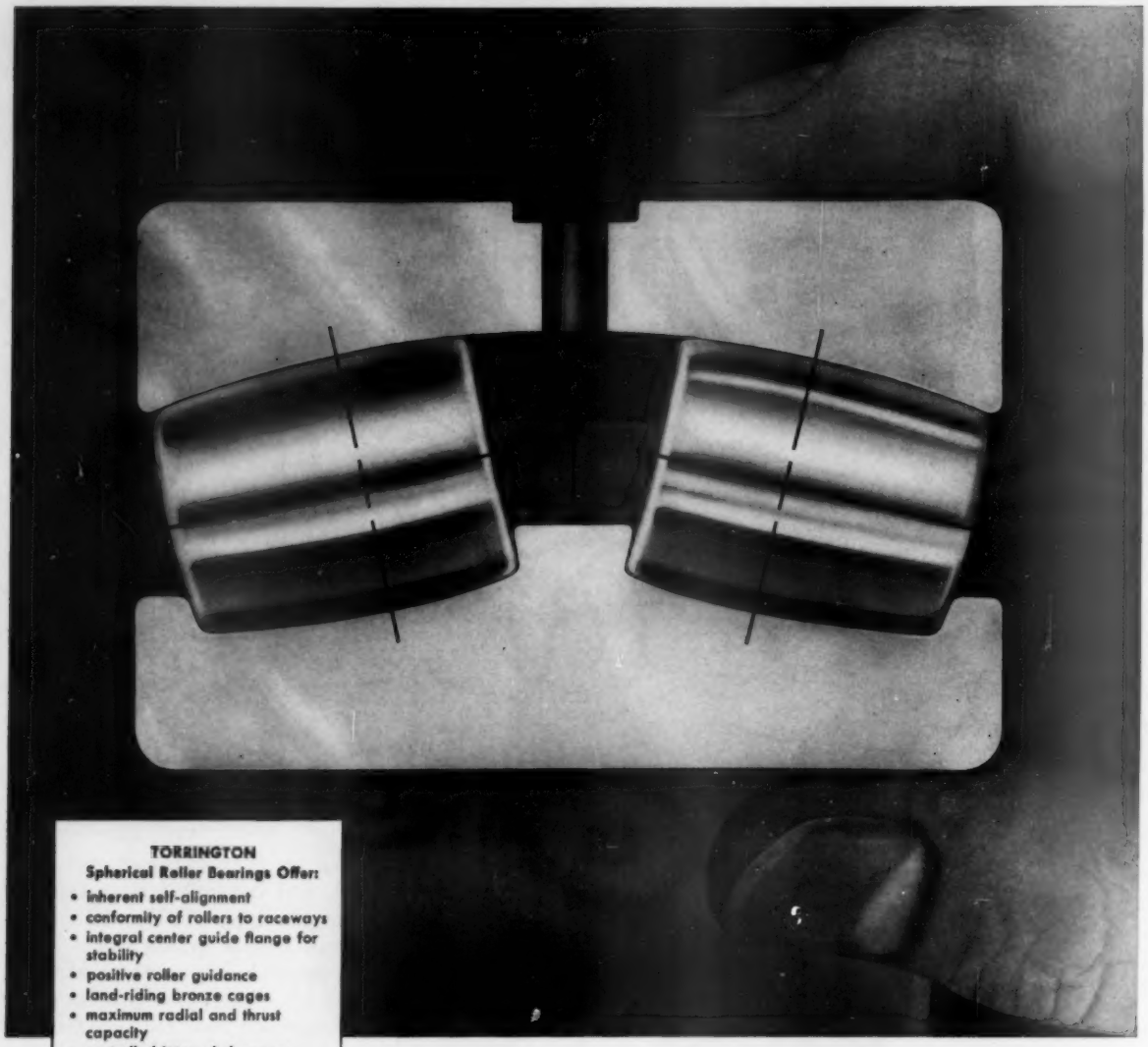
364-774

JOY

Joy Manufacturing Company
Oliver Building, Pittsburgh 22, Pa.

In Canada: Joy Manufacturing Company (Canada) Limited, Galt, Ontario

Enter 1210 on Reader Card



TORRINGTON
Spherical Roller Bearings Offer:

- inherent self-alignment
- conformity of rollers to raceways
- integral center guide flange for stability
- positive roller guidance
- land-riding bronze cages
- maximum radial and thrust capacity
- controlled internal clearance
- electronically selected rollers
- even load distribution
- long, dependable service life

Send for new Torrington Spherical Roller Bearing Catalog #258.

Shaped for Stability!

The asymmetrical shape of each roller in Torrington Spherical Roller Bearings contributes directly to operating stability and long service life.

The maximum roller diameter is not at the center of the roller. Located towards the center flange, it insures geometric positioning of the roller for positive guidance with free rolling action.

The roller shape also approaches that of a tapered roller. Lines extended from the roller-to-race contact zone converge at the roller and bearing axes. This approach to true conical rolling action further assures stability.

These are two more reasons why Torrington Spherical Roller Bearings operate cooler, quieter and with greater stability. For the ultimate in bearing performance and service life, always specify *Torrington* Spherical Roller Bearings. **The Torrington Company, South Bend 21, Ind.–and Torrington, Conn.**

TORRINGTON BEARINGS

Every Basic Type of Anti-friction Bearing

SPHERICAL ROLLER • TAPERED ROLLER • CYLINDRICAL ROLLER • NEEDLE • BALL • NEEDLE ROLLERS • THRUST

Enter 1211 on Reader Card

WASHINGTON LETTER

by EDGAR POE

Building Ahead of Last year Commerce Department records show that most major types of construction in 1959 have been running considerably ahead of 1958. Total value of work put in place the first three quarters of this year ran 15 percent higher than in the corresponding period of 1958. Only a small part of the rise was attributable to higher construction costs.

A department survey of business showed that businessmen are stepping up outlays for plant and equipment in the closing months of the year. The rise in the nation's total production was interrupted by the long steel strike which reduced output in this industry and others directly affected.

'Tax paid Vacations' A new warning that it will disallow "tax paid vacations," summer or winter, is issued by the Internal Revenue Service. IRS said it plans to closely check purported business trips which in effect represent vacations at resort hotels, hunting trips, or attendance at sports events.

Dual job Holders Labor officials, in the face of their preachings for a shorter work week, are apprehensive over the growth of "moonlighting" in this country. While no one keeps a running tabulation on the number of people that hold down two jobs, it is estimated that the number exceeds 3,000,000 and may run as high as 3,750,000. Unions frown on two jobs. As a result many union workers are tight-lipped about their secondary jobs.

Hospital Surgical Proposal With prepaid hospitalization insurance premiums rising, there is going to be an increased effort in Congress next year to put the federal government in the medical care and hospitalization business. The liveliest measure of all is the so-called Forand Bill. A number of doctors have already testified on the measure.

Anyone receiving social security benefits under the Forand bill would also receive hospitalization, medicines and paid surgical bills. No doctor bill, other than surgical, would be provided. Advocates of the Forand bill insist that the health insurance plans are inadequate, plus the fact that less than 40 percent of people over 65 have medical insurance of any kind. Opponents maintain that the insurance plans are adequate, and that many social security beneficiaries might prefer to buy other than hospital and surgical care if they were allowed freedom of choice.

This time last year the maximum social security tax was $94.50. It rose to $120 on January 1, 1959. Even if Congress does not add any additional social security for the next several years, the social security taxes are going up. Here is the rate schedule: For 1960-62, $144; 1963-65, $168; 1966-68, $192, and 1969, $216.

Alaska, Hawaii The Secretary of Commerce has directed the Bureau of Roads to make a study of the need for extension of the Interstate Highway System in Alaska and Hawaii. A report to Congress by January 14, 1960, is required and will include recommendations as to the approximate routes and the total mileage in each state.

Senator Raises Point Senator Albert Gore is challenging the legality of the Federal Bureau of Road's proposal to control the number of federal-aid highway contracts a state may enter into in a given period of time. The Tennessee Democrat, member of the Senate Public Works Committee, characterizes the restrictive plan as contrary to the rights of the various states.

In letters to President Eisenhower and Federal Highway Administrator Bertram Tallamy, Senator Gore maintains that apportionment of federal-aid highway funds to the states constitutes a moral and legal obligation to reimburse the states so apportioned when proper vouchers are submitted for work completed on the federal-aid road systems.

Pollution Bills go Over to 1960

House and Senate approved separate pollution control bills were laid aside in the final days of the 1959 session of Congress until the 1960 session on the theory they faced a possible pocket veto by President Eisenhower. The White House recommended $45 million of matching funds be cut to $20 million and that the entire program be turned back to the states. The House, ignoring the recommendation, passed a bill that would double the present annual authorization to $100 million. Subsequently, the Senate passed a bill authorizing $80 million. The two bodies were prepared for a compromise when a decision was reached to put off final action until early next year.

Congress did, however, approve a bill extending for four years the Air Pollution Control Act of 1955, authorizing $5 million a year for research studies by the Public Health Service into the causes and control of air pollution.

Political Battles

Labor is hot under the collar over the reform legislation passed by Congress. Moreover it is girding over an all-out battle at the polls in the 1960 state and national elections. Labor leaders in high places make no secret that they will make an all-out drive to strengthen labor's political machine next year.

The labor bill, the first enacted since the Taft-Hartley law of 1947, grew out of continuing exposure of union corruption and labor-management collusion by the McClellan Committee. The sensational disclosures resulted in editorials and many letters and telegrams demanding that Congress take some action to curb the gangsters and racketeers that have infiltrated into some unions and have gotten a stranglehold on them, thus harming the clean, above board unions.

Daily water Use rises

Demands for water in the United States is increasing enormously. The country is now using more than 262 billion gallons daily, equal to 1,500 gallons annually for every man, woman and child. Government officials assert that by 1975 the U.S. will need at least 450 billion gallons of water daily, or nearly twice as much as currently being used.

Meantime, the Office of Saline Water has greatly stepped up its research program to convert brackish and salt water into fresh, for human, industrial and agricultural consumption at a reasonable cost. Freeport, Texas, was chosen for the big Federal research project for the Gulf of Mexico region. Similar scientific projects will be established in other parts of the Nation. When the conversion program got well under way in 1953, the saline water transformation cost ran about $3 for each 1,000 gallons. It now has been reduced to $1. The national average cost for supplying fresh water is about 38 cents.

Cement use To climb AGC reports

The Nation's total volume of construction for 1959 is estimated at $73 billion, but it is expected to climb to $107 billion by 1970. Authority for the assertedly conservative estimates is the Associated General Contractors of America after a long-range study by the trade association. New construction is expected to account for about $79 billion; maintenance and repair work $28 billion.

The AGC study, the second since the original one in 1956, was for the purpose of estimating the constructing industries' future requirements for Portland cement and structural steel. The total yearly cement requirements by 1970 are expected to reach 435,000,000 barrels, as compared with 306,000,000 barrels in 1959, and 5,431,000 tons of fabricated steel, as compared with 3,993,000 tons in 1959.

Census Bureau Reports

The United States Census Bureau has started releasing a count of potential customers and competitors. A series of additional reports similar to the census of mineral industries and manufacturing will be issued by the end of the year or early in 1960. The census of business similar to wholesaling, retailing and service trades has been issued this fall.

R. W. Burgess, director of the Bureau of the Census, asserts with authority that the precise information obtained in the census tabulations is invaluable to the business man seeking to pinpoint a particular market.

The biggest census of them all, the decennial population count, will start April 1, 1960. It will include about 25 inquiries, two-thirds of them pertaining to social characteristics such as work status, occupation, industry and income.

The 1960 census of housing including about 35 inquiries involving the basic characteristics of the housing unit, the plumbing and water supply, number of bathrooms, source of water supply, etc., will be taken simultaneously with the population count.

Best Protection against Rust and Corrosion

Goodyear Rims with exclusive Bond-a-Coat finish

The above pictures clearly show the protective effect of Goodyear's exclusive process—Bond-a-Coat.

This unique finish—originally proved on Goodyear Agricultural Rims—keeps rims from rusting. More than that, it protects tires, too—helps you get maximum mileage out of every tire you buy.

Bond-a-Coat is just one of the reasons why you'll find it pays to specify Goodyear Rims, both for replacement and on new equipment. Some of the others:

Unusual strength: Thanks to special designs and closer tolerances, balance and alignment are greatly improved. As a result Goodyear's present-day rims are suited for today's needs.

Job-Fitted: Goodyear Rims are job-fitted. Result: less tread cracking, tread wear, reduced sidewall and bead failure.

Special tools: Goodyear provides both hydraulic and hand tools especially made for modern equipment.

Talk it over with your local Goodyear Rim Distributor. He'll help you pick out the type and size of rim best suited to your needs. Or write: Goodyear, Metal Products Division, Akron 16, Ohio.

This is how Goodyear stores its rims—outdoors—thanks to Bond-a-Coat.

Your tires go farther on RIMS by

GOODYEAR

MORE TONS ARE CARRIED ON GOODYEAR RIMS THAN ON ANY OTHER KIND

Enter 1200 on Reader Card

LABOR RELATIONS

A ROUNDUP OF ACTUAL DAY-TO-DAY IN-PLANT PROBLEMS AND HOW THEY WERE HANDLED BY MANAGEMENT MEN

How would you decide?

If an employe is temporarily demoted because of poor business, can you pay him a lower wage rate?

What Happened: The company had a policy which provided that an employe who was temporarily promoted or demoted receive no change in wage rate. When business took a nose-dive there was a cutback in manpower and Sam Gimbel was demoted. He received the rate for the job which was lower than his previous pay. He took his grievance to arbitration on the grounds that his demotion was temporary and, therefore, he should not get a lower rate. He argued that business slumps are rarely permanent so his demotion must be interpreted in accordance with the company policy.

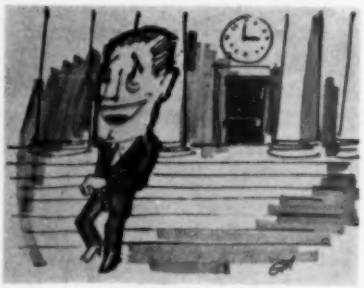
The company held that this policy was not meant to apply to economic situations.

Was the company:
Right? ☐ **Wrong?** ☐

What Arbitrator Kelliher ruled: "Fluctuations due to economic conditions resulting in increases or decreases of the work forces are not defined as 'temporary.' At the time that a decision has to be made to either increase or decrease the work force due to economic considerations, management has no possibility of determining the duration of the conditions that give rise to either action.

"Where economic conditions warrant an increase in the work force, the higher rate is applied immediately on a promotion. Certainly then, when a downgrade movement is made necessary due to economic conditions, employes demoted should likewise receive the rate of the job to which they are assigned immediately upon demotion. If all demotions due to business declines are considered temporary, then likewise all promotions due to increases in business would have to be considered temporary because there is no 'normal employment.' Such a finding would seriously affect the earnings of employes who were promoted. This would not be to the long-range benefit of the employes. Therefore, I find that the company's position is correct."

Must an employe on jury duty come to work if he gets out of court early?



What Happened: Arthur Patchin worked the second shift which started at 4 p.m. He was called for jury duty and served for 6 days during which time he did not show up for work.

When the week was up, Patchin presented the company with a check for $36.00 which he had received for jury duty. He asked that the company make up the difference between his regular pay and the jury pay. The company did have a policy of making up such differences. But in Patchin's case, it refused. It maintained that he could have come to work because on all of those 6 days court let out early enough for Patchin to have worked part or all of his shift.

Patchin admitted that he got out early, but he still wanted his money.

Was Patchin:
Right? ☐ **Wrong?** ☐

What Arbitrator Edelman (chairman) ruled: "Jury duty represents a rather common type of benefit agreed to by many employers and is found in numerous collective bargaining agreements. Its aim is to provide competent jurors through the removal of the monetary loss that would otherwise accompany jury service. To require a second-shift employe to be available for jury service during the day and later to work his regular shift, ending after midnight, is to remove the incentive for jury service, which is the primary aim.

"To argue, as the company did, that perhaps Mr. Patchin did not actually serve on a jury but was only available for service and, therefore, could have easily reported by 4:00 p.m., cannot be carried through logically. What if a first-shift employe is released from jury service by 10:30 a.m.—should he report for work before noon and complete his shift? The company admitted it had no policy on such a question. If the company's argument were accepted, how late would a first-shift employe have to serve before reporting on his regular shift?

"The fairest application would seem to be that employes called for jury duty should receive the difference between thier regular pay and the amount given them for jury service whether they actually serve on a jury or are only required to be available to the court for jury service but do not actually serve."

(Continued on page 26)

MORE AND MORE THE ANSWER TO LARGE VOLUME SPECIFICATION AGGREGATE AT LOW COST IS

WEMCO

More often than not an analysis of an aggregate production problem today will come up with WEMCO as the sound solution.

The reason: WEMCO's near-20 years of experience in the development of equipment and methods, aiding operators to keep pace with increasing volume demands and stricter specifications.

WEMCO equipment for preparation, beneficiation and handling of aggregate is at work in hundreds of installations.

We'll be happy to discuss your operation in terms of profitable steps for the future.

a division of
Western Machinery Company, 650 Fifth St., San Francisco, Calif.
and throughout the world

Enter 1201 on Reader Card

ECONOMIZE

with built-in REOPCO*

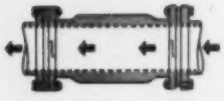
Massco-Grigsby Pinch Valves

...their Long Wearing Life makes them

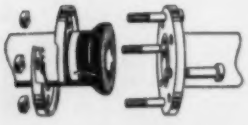
Cost Less to Own!

- **Rubber or Neoprene sleeves for abrasive and corrosive pulps and liquids**
- **1" to 14" inside diameter**
- **Pressures to 150 psi.**
- **Temperatures to 200° F.**
- **Manual or power-operated closing mechanisms**
- **Automatic regulation and remote control available.**

Patented "hinged" sleeve. Recesses serve as "hinges" during compression; reduce strain and permit tight closing.



Unobstructed flow eliminates high friction loss.



Split flanges and Flex Seal ends assure perfect seal.

*Reduced operating costs.

and Laboratory Equipment, too

4" x 6" Massco Laboratory Jaw Crusher

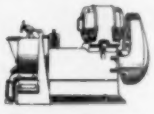
Welded steel frame; manganese steel jaw and cheek plates; bronze bushed bearings; smooth jaws give better product and easier cleaning. Adjust for plate wear and product size by convenient hand wheel adjustment.

6" and 10" Massco Gy-Roll Reduction Laboratory Crusher

Reduces ½" feed to as fine as 10 mesh in single pass. High capacity, low power consumption.

Laboratory Crushing Rolls

Sizes (Diameter x width): 8" x 4", 10" x 6", 10" x 8", 12" x 10" and 12" x 12". Adjustable roll space setting up to ¾". Double V-belt drive. Heavy, cast Meehanite frame absorbs vibration, results in long life.



Massco-McCool Pulverizers

Disc type grinder with a planetary movement. No gears. Will grind to 150 mesh in one pass.

WRITE FOR CATALOGS

Manufacturing Division

MINE AND SMELTER SUPPLY CO.

DENVER 16, 3800 RACE STREET | NEW YORK 17, 122 E. 42nd STREET | SALT LAKE CITY 1, 121 W. 2nd S. | EL PASO, 1515 11th AVE.

LICENSED MANUFACTURERS AND SALES AGENTS in Canada, Australia, Sweden, England, South Africa

SALES AGENTS in Peru, Chile, Philippine Islands, Japan, New York City (for Continental Europe) and in principal cities of the U.S.

Enter 1202 on Reader Card

SIMPLICITY

GRIZZLY FEEDER

3' x 10' Model OA—10—A3

eliminates need of apron feeder and scalper . . .

Rock can't jam . . . hourly operating costs lowered

The unique design of the Simplicity Grizzly Feeder, which combines feeding and scalping in one operation, eliminates rock jams thus assuring positive uniform flow of material into the crusher.

One operator of a Simplicity Grizzly Feeder says: " . . . we have used the heaviest type of apron feeders for years and have found it necessary to shut down at least 2 or 3 times a year to hard surface the flights, inasmuch as our material is so abrasive . . . we installed a Simplicity (Grizzly) Feeder . . . with 1/4" pan and 3/16" liner . . . and are glad to report that, AFTER 9 MONTHS OF CONTINUOUS OPERATION, THE FEEDER PAN SHOWS PRACTICALLY NO WEAR WHATSOEVER, and is operating around the clock doing an excellent job of feeding at all times . . . "

3' x 12' Model OA—10—A3

The Grizzly Feeder costs less than 50% of the combined apron feeder and scalper . . . weighs considerably less . . . makes a more compact plant . . . and reduces loading height by several feet. While these factors show up so prominently in portable plant production, they are just as effective in a permanent plant installation for the crushed stone, sand and gravel and mining industries.

214

Send for Catalog #571 for complete information on OS-A-VEYOR and GRIZZLY FEEDERS.

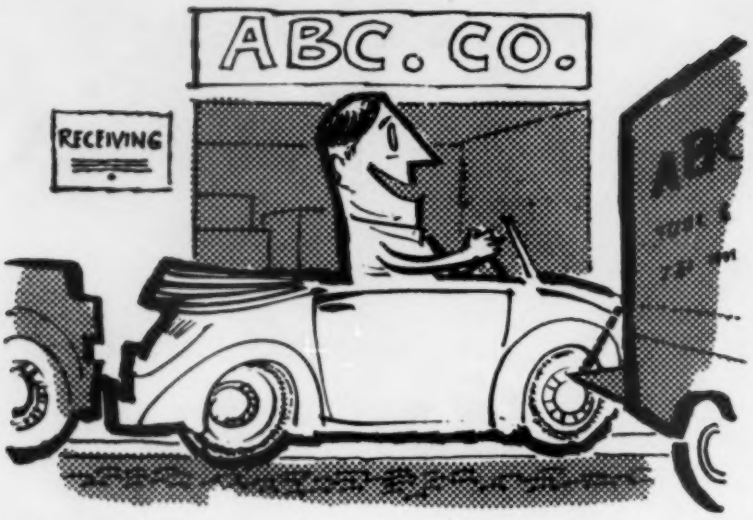
SALES REPRESENTATIVES IN ALL PARTS OF THE U. S. A.
FOR CANADA: Simplicity Materials Handling Limited, Guelph, Ontario
FOR EXPORT: Brown & Sites, 50 Church Street, New York 7, New York

Simplicity
TRADE MARK REGISTERED

ENGINEERING COMPANY • DURAND 13, MICHIGAN

Enter 1288 on Reader Card

(Continued from page 22)



Does an employe have to obey an "unwritten" rule?

What Happened: Bill James was sick and tired of scrounging around for a parking spot. The company lot was inadequate and most other areas were restricted for parking. However, there was one space, in front of the company's entrance, that was not taken and Bill moved his car into it one day. While he was on the job, his supervisor came over and said: "Bill, you can't park your car there."

"Why not? Is it illegal?"

"No, it's not illegal at all. But we have always prohibited employes from parking there because we must leave room for delivery trucks."

"Call me when the delivery truck comes. I'll move my car then," Bill said.

"You move it right now," the foreman ordered. "We have a rule that no one parks there, and that's that."

"I've seen all the rules in our booklet. Show me the rule in writing," was Bill's retort.

Bill got a 3-day layoff for insubordination. He argued at the arbitration:

1. I don't have to obey any "unwritten" rule. All the rules are listed in our booklet.
2. The foreman has no jurisdiction over my actions outside the plant. My car was legally parked in the street. It was not company property.

The company countered:

1. We have prohibited parking at the curb for 15 years. The employe knew it. We don't need it in writing.
2. When an employe's actions might interfere with company operations, we have jurisdiction. Bill's car could have interfered with deliveries.
3. He was insubordinate. He should have obeyed the foreman's order and grieved later.

Was Bill:
Right? ☐ **Wrong?** ☐

What Arbitrator Geller ruled: "It is clear that Bill wilfully disobeyed his supervisor's orders. The restriction on parking was known to the employes and, although unwritten, had been honored by them through the years. The union argues that the rule and the supervisor's orders exceeded company authority since the company has no right to regulate behavior of its employes off company property. While this may have some validity as a general principle, under the instant circumstances, I find that the prohibition of parking in front of the company premises has a clear and direct impact on deliveries. The parking restriction and the supervisor's order to Bill were therefore reasonable and justified. Bill's wilful disregard of such instructions was grounds for discipline."

May an employe who returns from sick leave refuse to take a physical examination?

What Happened: Bob Collins was out on sick leave for 2 months. When he came back he brought a note from his own doctor stating that Bob was well enough to return to his job. However, the management insisted that he submit to an examination by the company doctor. He refused because "he had no confidence in the company doctor." The company offered to have a mutually-selected outside doctor conduct the examination. Bob still said "no." He was fired. At arbitration he gave these reasons for refusing:

1. There is nothing in the union contract which gives the company the right to require a medical exam for sick-leave returnees.
2. Other employes have returned from sick leave and were not required to take a physical exam.
3. This is a new rule—and you can't establish a new policy without negotiation.

The company refuted Bob's arguments:

1. We have a right to make reasonable rules in order to run our plant properly. If we had to negotiate every new little rule, we'd never have time for anything else.
2. There's nothing in the contract which forbids us from establishing a new sick-leave rule, so we maintain the right to do so.

Was the company:
Right? ☐ **Wrong?** ☐

What Arbitrator Stouffer ruled: "The company has the right to establish reasonable rules regarding the direction of its working force. The establishment of a rule requiring an employe to submit to an examination by a company doctor after leaves for illnesses or injuries, in order for the company to determine whether the employe has sufficiently recovered to return to work is reasonable.

"The reasonableness of such rules has consistently been upheld by arbitrators. The company has the right to corroborate the findings of the employe's doctor. An examination of the agreement fails to reveal any provision prohibiting or limiting management's right to establish such a rule.

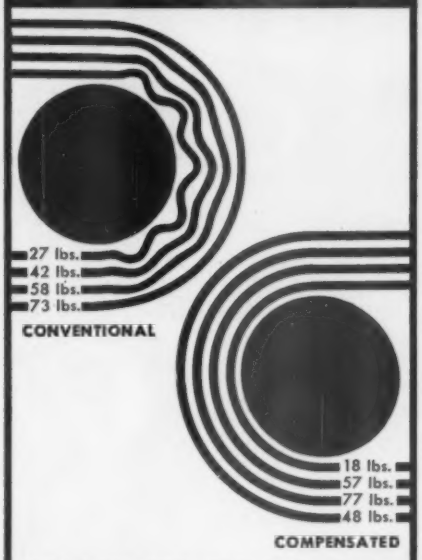
"This Arbitrator finds, however, that there was not sufficient publicizing to make it generally understood by employes—under what circumstances it was to be enforced. It is apparent that there was considerable confusion and lack of knowledge as to the rule's applicability. In view of this, the Arbitrator finds that discharge was too severe a penalty. This grievant should be reinstated, without back pay, and returned to work upon the finding of an impartial doctor that grievant is physically and medically fit to return to work." END

RAY-MAN CONVEYOR BELT
Lasts Longer on Tough Hauls

R/M engineering makes the difference with Ray-Man Conveyor Belt. Cushioned strength members give it the resiliency to take the impact of shock loading . . . the flexibility to train better, trough naturally. Balanced *Double*-Compensation relieves outer ply stresses, prolongs belt life under the most rugged operating conditions. R/M's exclusive "XDC" Cover gives Ray-Man extra protection against wear, tear, cuts and abrasion never before possible.

Ray-Man Conveyor Belt is rip resistant. It requires no breaker strip . . . holds fasteners far better than other constructions. Like all R/M heavy duty conveyor belts, Ray-Man is both moisture resistant and mildew-proof. Let an R/M representative show you the engineered advantages of Ray-Man Conveyor Belt and other R/M constructions . . . extra-cushioned Homocord for unusually severe shock loading . . . R/M Tension-Master for extra long lifts, high tensions. Write for Bulletin M302.

STRESS-RELIEF OF OUTER PLIES MEANS LONGER BELT LIFE... "More Use per Dollar"



CONTROLLED PLY ELASTICITY

Note how Double-Compensation at right equalizes ply stresses.

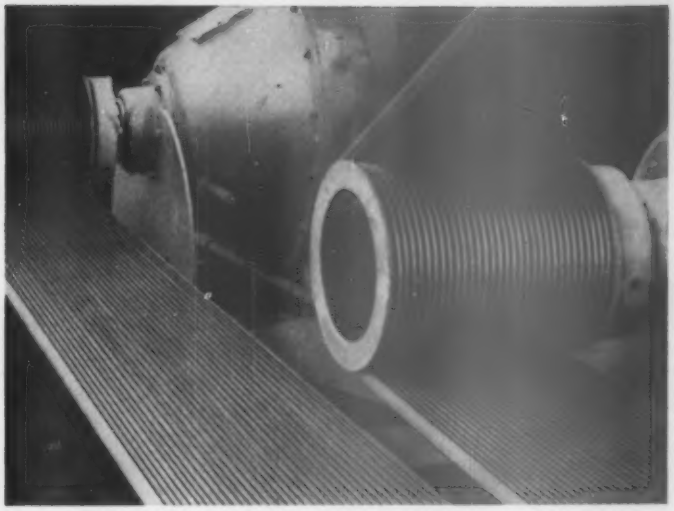
1. Center plies on neutral axis and better protected carry more load.
2. Outer plies stress-relieved by adjusting to tension and compression.

INDUSTRY'S *ONLY* COMPENSATED BELT

Ray-Man Compensation relieves outer ply stress . . . allows outside ply to elongate more than inner plies as the belt flexes around the pulleys. Inner plies no longer "loaf", but carry full share of the load.

Outer ply is better able to absorb strain and impact of loading, pull as a strength member, *protect* the inner plies, hold fasteners or splice longer.

And, because Ray-Man is *double Compensated*—both top and bottom plies stress-relieved—Ray-Man Compensation prolongs belt life, even where operated over reverse bend, snub or take-up pulleys!



R/M POLY-V® DRIVE—*MORE* POWER IN *LESS* SPACE

A single unit belt across full width of the drive sheave . . . not an assembly of V-belts . . . gives patented Poly-V twice the tractive surface to deliver up to 50% *more* power in the same space as a V-belt drive — or *equal* power in ⅔ the space! Multiple-belt "matching problems" are eliminated . . . equipment downtime and belt replacement costs reduced to a minimum. Poly-V assures constant belt speed ratios from no load to full load to provide the smoothest and coolest running—longest wearing drive for your heavy duty power driven equipment. Just two Poly-V* belt cross-sections meet every requirement! Write for Bulletin M141.

*Poly-V is a registered Raybestos-Manhattan trademark. Patented.

HOMOFLEX HOSE—HANDLES EASIEST ON THE JOB

R/M's exclusive construction for air, water, other fluids and gases is as flexible as a rope! Homoflex Hose has no pre-set twist . . . coils and uncoils freely in *any* direction — *without* kinking. Light in weight, yet strong enough to stand up under the toughest conditions, Homoflex is the easiest handling hose made for rugged general service. Inseparable tube-to-cover bond greatly increases hose life . . . reduces hose costs! Uniform inside and outside diameters make Homoflex easier to couple, too . . . assure fuller, faster flow on every job.

Only R/M offers exclusive Homoflex Construction. Write for Bulletins M694 and M610.

RM61B

BELTS • HOSE • ROLL COVERINGS • TANK LININGS • INDUSTRIAL RUBBER SPECIALTIES

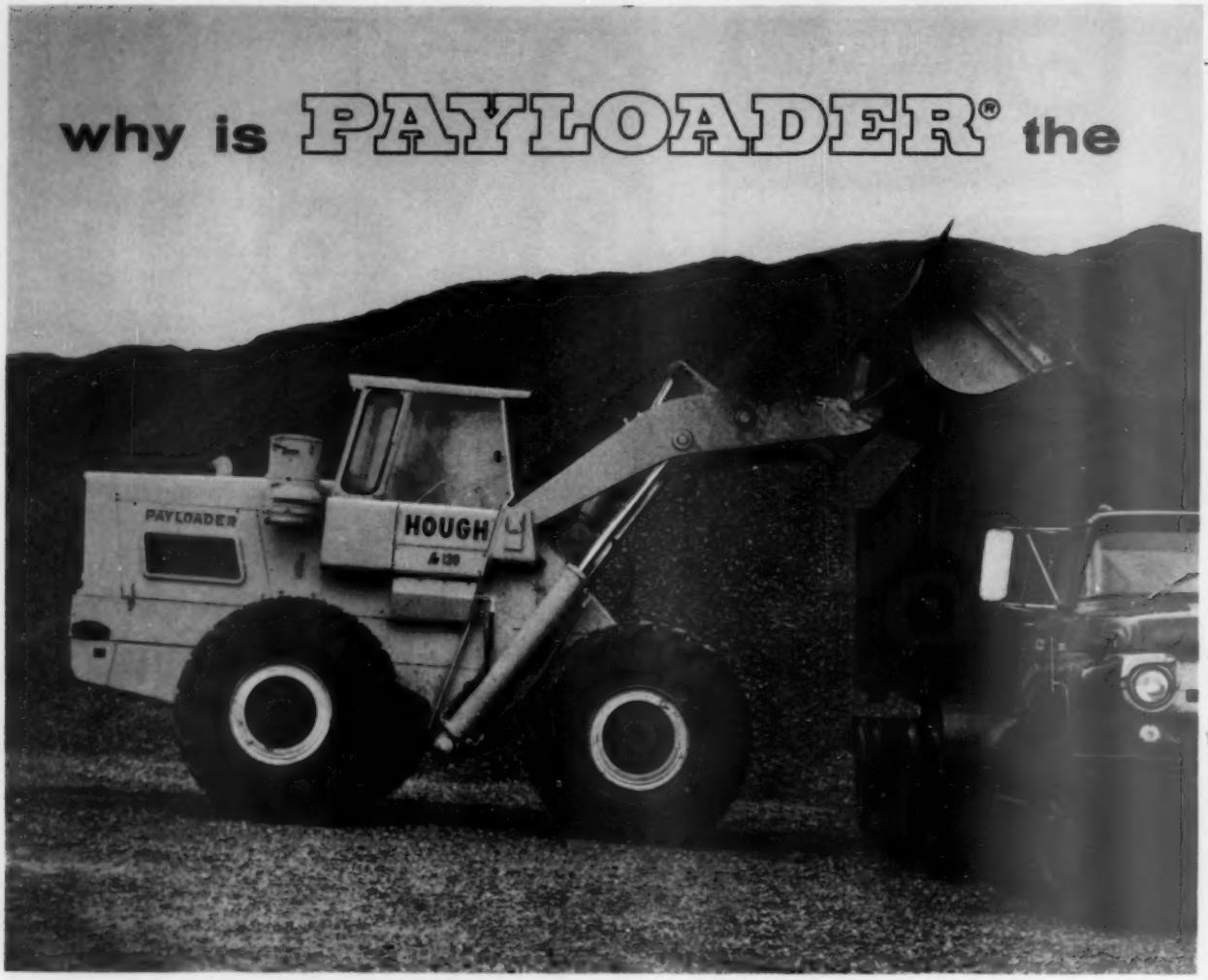
MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Other R/M products: Abrasive and Diamond Wheels • Brake Blocks and Linings • Clutch Facings • Asbestos Textiles • Mechanical Packings • Engineered Plastics • Sintered Metal Products • Industrial Adhesives • Laundry Pads and Covers • Bowling Balls

Enter 1203 on Reader Card

why is PAYLOADER® the



LOADING — New H-120 handles up to 7 tons per pass; lifts to more than 14½ feet under hinge pin; has forward reach of 3½ feet ahead of front tires. Buckets to 6 cu. yds.

CHARGING HOPPERS — This is a popular and highly-efficient use for all sizes of "PAYLOADER" tractor-shovels because of their fast shuttle cycles made possible with power-shift transmission.

STOCKPILING — Whether shifting stockpiles, spreading them, or cleaning up around them, "PAYLOADER" units have the speed, and the more reliable traction from power transfer differentials to do a fast job.

Enter 1285 on Reader Card

STANDARD OF ANY COMPARISON?

The growing trend toward the use of versatile, rubber-tired tractor-shovels makes it increasingly vital for pit, quarry and plant owners to know why "PAYLOADER" units are the overwhelming choice and the standard of comparison.

It is because HOUGH pioneered the first integrated rubber-tired loader more than 20 years ago and the first four-wheel-drive tractor-shovel over 11 years ago.

It is because HOUGH has developed most every feature and major improvement during these years. Items like the rear-mounted engine; bucket tip-back; the use of torque-converters, power-shift transmissions and planetary axles.

It is because HOUGH'S "balanced-design" gives better stability and keeps "dead-weight" at a minimum. The result is a better "horsepower-to-weight" ratio for top production.

It is because "PAYLOADER" units have a closed, pressure-controlled hydraulic system with dual and triple filtering.

It is because all HOUGH four-wheel-drive units cool the power-shift transmission and torque-converter oil with a separate oil-to-air cooling radiator.

It is because HOUGH offers a larger selection of machines for specific jobs. More than 20 models in 8 different capacity ranges for your consideration.

It is because there have been more integrated rubber-tired "PAYLOADER" tractor-shovels sold than all other makes.

It is because these machines are sold and serviced by the finest, most completely equipped distributor organization in the whole wide world. Why not contact him?

HOUGH®

THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS
SUBSIDIARY — INTERNATIONAL HARVESTER COMPANY

HOUGH, PAYLOADER, PAYMOVER, PAYLOGGER and PAY are registered trademark names of The Frank G. Hough Co., Libertyville, Ill.

QUARRY LOADING — The powerful breakout, tip-back digging action of a "PAYLOADER" bucket is what it takes to get big loads of large-size stone in fast single passes.

EXCAVATING — "PAYLOADER" applications are not limited to rehandling. Many are used to dig and load direct from the bank or pit and to strip overburden.

UNDERGROUND — Many "PAYLOADER" units are in underground mines and doing clean, efficient jobs. Diesel power with exhaust scrubbers are available.

THE FRANK G. HOUGH CO.
705 Sunnyside Ave., Libertyville, Ill.

Send data on all "PAYLOADER" models and attachments

Name.....

Title.....

Company.....

Street.....

City..... State.....

12-B-4

Enter 1286 on Reader Card

PEOPLE IN THE NEWS

Gregory appointed operations executive

WAYNE A. GREGORY has been named manager of operations for the Buffalo Crushed Stone Corp. For the past three years, Mr. Gregory has been group superintendent at Houdaille Construction Materials, Inc., Morristown, N.J., supervising several of Houdaille's New Jersey units. He has been active in the National Crushed Stone Association and other professional societies in the construction materials field. He attended Rutgers University and has an extensive background in business and administration. In his new position at Buffalo Crushed Stone, Mr. Gregory will be in charge of operations at all three of the company's producing units in western N.Y., with headquarters in Bowmansville.

Matthews marks 50th year with Ideal

M. O. MATTHEWS, executive vice president of the Ideal Cement Co., is observing his 50th anniversary as an employe of the company.

Mr. Matthews started work in 1909 for the Oklahoma Portland Cement Co. which was purchased by Cement Securities Co. Ideal Cement Co. was organized as successor to Cement Securities in 1924. Mr. Matthews became superintendent of the Oklahoma properties in 1918. He was vice president of Ideal's southern division from 1948 to 1952, when he was elected executive vice president of Ideal.

4th generation on cement firm's board

AFTER SERVING on Louisville Cement Co.'s board of directors for more than 50 years, Isaac Hilliard resigned at the age of 80. His son, Henning Hilliard, elected to succeed him, is the fourth generation of the family on the board of the 129-year-old Kentucky company.

Calaveras names assistant sales manager

THE APPOINTMENT of Jack Gordon as assistant sales manager of Calaveras Cement Co. was announced today by Mel J. London, vice president in charge of marketing. London also announced the appointment of David M. Wade as assistant traffic manager.

Mr. Gordon has been regional division manager for Calaveras since February 1957, and for the preceding three years was the company's sales representative in Alameda and Contra Costa Counties. He had previously worked with U. S. Gypsum Co.

Mr. Wade has served in the Calaveras traffic department since 1956, having joined Calaveras after nine years with Southern Pacific Co.

Trap Rock promotes two, transfers one

THE PROMOTION of two supervisory staff members of New York Trap Rock Corp.'s production department and a transfer has been announced by Henry Schwellenbach, production manager of the corporation.

Robert E. Mead, assistant superintendent of the Haverstraw Quarry, has been promoted to seismologist and acoustician, and John J. Harkins, supervisor of the Tomkins Cove Quarry has been elevated to assistant superintendent of that installation. John C. Foster, assistant superintendent of Tomkins Cove Quarry, has been transferred to a similar post at the Haverstraw Quarry.

U. S. Borax executives named

DR. D. S. TAYLOR and Dr. C. L. Randolph were appointed president and vice president, respectively, of U. S. Borax Research Corp., a U. S. Borax and Chemical Corp. subsidiary. Dr. Taylor succeeds Hugo Reimer, executive vice president of the parent company, who becomes chairman of the research subsidiary.

Elected president at Portland Cement of Utah

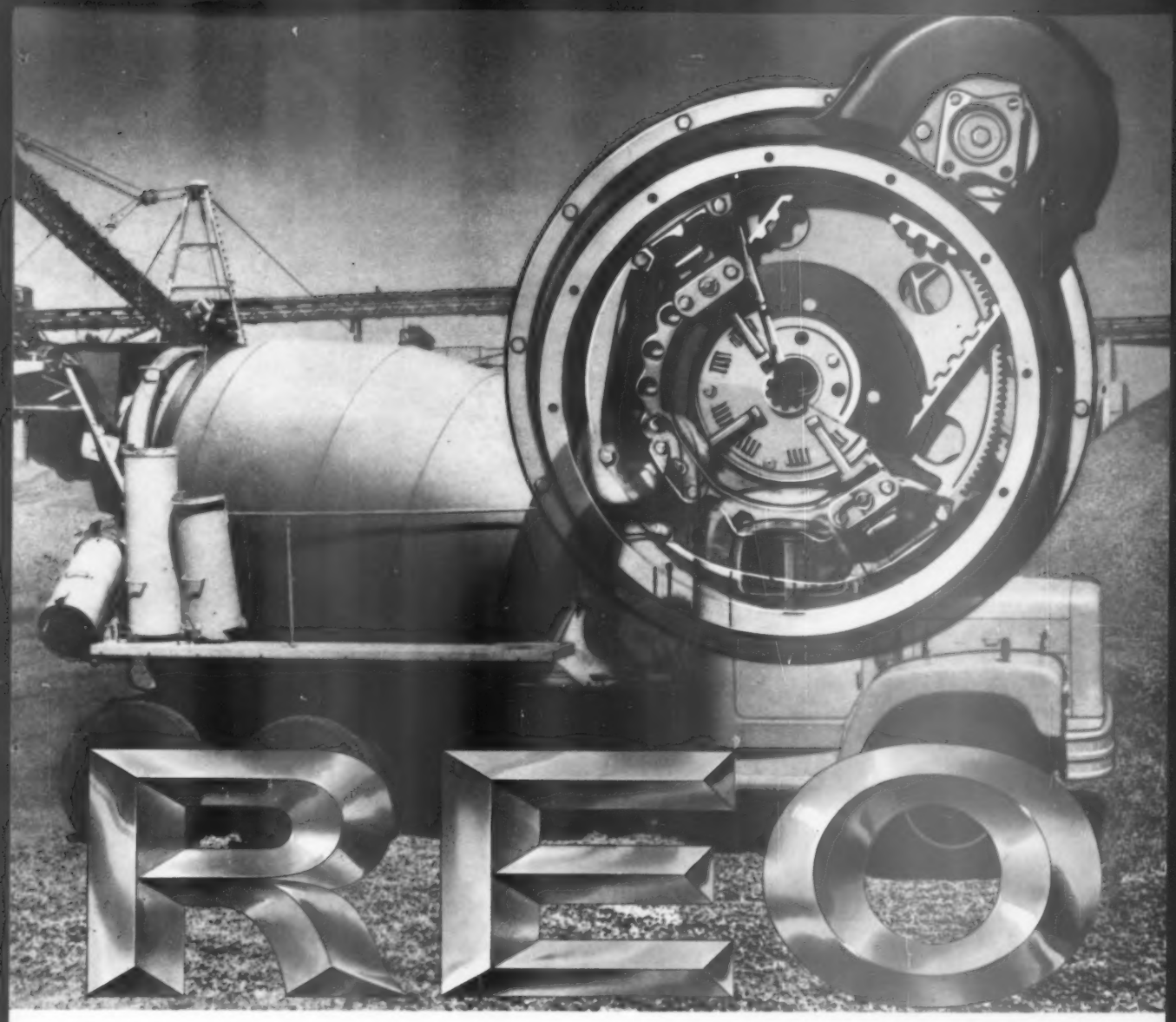
F. S. PRINCE has been elected to the post of president of Portland Cement Co. of Utah, Salt Lake City. Mr. Prince, a member of the law firm of Mulliner, Prince and Mulliner, succeeds Ashby Snow, who resigned.

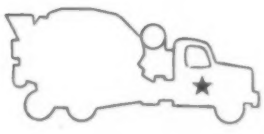
UA Cement announces personnel shift

UNIVERSAL ATLAS CEMENT DIVISION of United States Steel has announced a retirement and two promotions.

Raymond W. Smith, plant manager of the Northhampton (Pa.) plant, is retired after 38 years of service with Universal Atlas. Richard E. Miller, assistant plant manager at Northhampton, has been appointed to succeed Mr. Smith. Roger Melgary, plant industrial engineer, will succeed Mr. Miller as assistant plant manager.

(Continued on page 35)



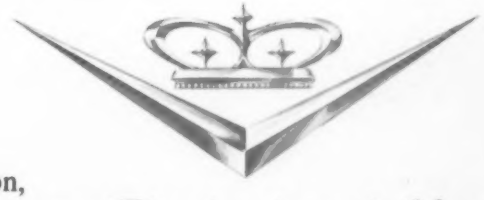


Reo's revolutionary new Flywheel P.T.O. brings to transit mix operators a "*bonus*" *payload increase from 400 to 600 lbs. per trip*— actual weight savings in a 6½ cu. yd. mixer unit resulting from the elimination of separate engine power.

Also eliminated are the headaches of separate service and maintenance requirements.

Reo engineered and installed as an integral part of the chassis engine drive, the Reo Flywheel P.T.O. supplies the mixer with a lighter and more efficient new source of power—smooth . . . even flowing . . . direct.

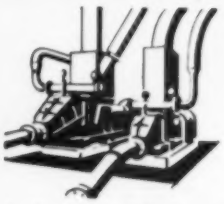
Most important, operators can have the "bonus" payload advantage of Reo's new P.T.O. at a low initial cost of equipment. Now available in Reo's rugged "C" Series line of transit-mix trucks. Another product of Reo's creative engineering skill has been added to the many important values found only in Reo Trucks. Reo Division, The White Motor Company, Lansing, Michigan.



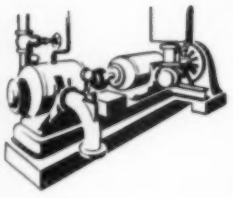
Gold Standard of Values

FULLER EQUIPMENT

for the process industries

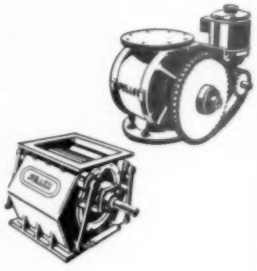


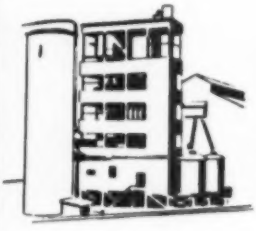
Pneumatic Materials Handling Systems. Widely specified throughout the process industries, Fuller's range of equipment offers best single source for solving problems in moving dry bulk materials pneumatically. Fuller-Kinyon Pumping Systems, Airveyor® Pressure and Vacuum Conveying Systems, and F-H Airslide® Fluidizing Conveyors are completely sealed to prevent both contamination of the product and any leakage of dust, etc., into the surrounding area. They are used to move dry, granular and pulverized materials to and from cars, ships, trailers, storage and processing points.



Fuller Rotary Compressors and Vacuum Pumps are vibration-free, can be installed anywhere, even on balconies. Fewer moving parts mean minimum maintenance. Compressors and Vacuum Pumps handle air and gases from 30 to 3300 cfm at pressures to 125 lb. gage. Vacuums to 29.95 in. (referred to 30-in. barometer).

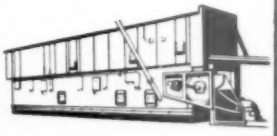
Fuller Vane-type and Roll Feeders . . . for volumetrically controlled feeding of a wide range of dry pulverized or granular materials. Also Fuller Rotary Valves . . . used under silo deck slabs and bins to permit the free flow of pulverized materials which tend to arch, such as lime and cement raw materials.





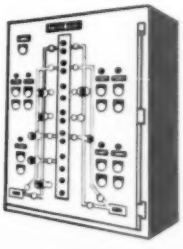
Fuller Preheaters, Humboldt Suspension Type . . . for preheating dry, pulverized Portland cement raw materials with rotary kiln waste gases.

Fuller Horizontal and Inclined Grate Coolers are compact, easily installed for fast, efficient cooling of materials such as nodulized phosphate rock, pebble lime, ores, dolomite, iron nodules and Portland cement clinker from 2800°F. or higher to any desired point within a reasonable range of atmospheric temperature.



Fuller-Material-Level Indicators signal audibly and visibly when materials reach a predetermined high or low level. Controls conveyor motors, valve circuits, etc.

Fuller Control Panels permit automatic, remote, one-man control of multiple operations. Easily-read panel permits visualizing flow of material to storage or from process bins.



Fuller equipment is designed to help give you maximum efficiency at minimum cost. Send today for more detailed literature.

1356
G-210

FULLER COMPANY GENERAL AMERICAN TRADE MARK

FULLER COMPANY
102 Bridge St., Catasauqua, Pa.
Subsidiary of General American Transportation Corporation
Offices in Principal Cities Throughout the World

Fuller
. . . . pioneers in harnessing AIR

Enter 1272 on Reader Card

(Continued from page 32)

Elected vice president of Texas Industries

VIRGIL SEWELL has been elected a vice president of Texas Industries, Inc. The former North Texas production manager for the company has had 17 years' experience in the cement business. He was general mill foreman of a national cement company before joining Texas Industries in 1953 as general superintendent of all Haydite lightweight aggregate facilities.

Named to PCA

GEORGE H. TSURUOKA, AIA, has been appointed manager of the Housing and Cement Products Bureau of the Portland Cement Association. He succeeds S. H. Westby, who was named technical advisor in the bureau.

Mr. Tsuruoka comes to PCA from Street and Smith Publications and has a broad experience in national housing promotion campaigns. He has studied at the Massachusetts Institute of Technology, Catholic University and George Washington University.

Philip Carey Co. announces promotions

PAUL D. JAPP, vice president of Philip Carey Mfg. Co., is now also director of sales for Carey's industrial insulation and magnesia chemical products. Before joining Carey last year, he was vice president of Pittsburgh Corning Corp.

A. E. Binger, who has been industrial sales manager since 1950, is promoted to vice president of the Industrial Products Division and will be responsible for the sale of asbestos fibres and other products.

E. C. Meisner has been appointed division vice president for the company. The former general manager of Carey's Insulation Division will be transferred to the firm's general offices where he will co-ordinate research, engineering and quality control for all company divisions.

Dundee names Chicago distribution manager

GERALD J. MULVEY, former material handling supervisor for the aircraft engine division of Ford Motor Co., has been named manager of the Chicago

distribution station of Dundee Cement Co. Mr. Mulvey attended the Walton College of Commerce and the Freight Traffic Institute. His new assignment is a key position in the five-state area to be served by the new Dundee, Mich., plant.

Names delegate to Geological Congress

DR. JOSEPH L. GILLSON has been appointed representative to the International Geological Congress, 1960, in Copenhagen by the board of directors of the American Institute of Mining, Metallurgical and Petroleum Engineers. Dr. Gillson, editor-in-chief of the third edition of the AIME's publication, "Industrial Minerals and Rocks," is chief geologist of E. I. du Pont de Nemours & Co. and president-elect of AIME.

Named director of trade relations

RUBEROID CO., New York, N.Y., has announced the appointment of W. G. Neel to the newly created post of director of trade relations. In this capacity, Mr. Neel will maintain liaison between key personnel of the company's customers, suppliers and prospects, and Ruberoid's sales staff. He will continue to serve as manager of the asbestos fiber division to which he was named in 1958.

Mein elected to Flintkote board

WILLIAM WALLACE MEIN, SR., chairman of the board of Calaveras Cement Co., was elected to the board of directors of the Flintkote Co.

Buffalo Crushed Stone promotes executives

HERBERT H. ROOSA, president of Buffalo Crushed Stone Corp., has announced the promotion of two key executives.

Named director of product engineering was Daniel J. Miller, Jr., a vice president of the corporation, who has been manager of the Gunville Road Concrete Pipe Plant since its opening a year ago. A graduate of Cornell University, Mr. Miller was formerly a vice president of the North Jersey Quarry Co., now one of the Houdaille construction materials units.

Succeeding Mr. Miller as manager of the Gunville Road pipe plant is Donald Yorke, who has been associated with Houdaille and its predecessor companies since 1946.

OBITUARIES

David Eshelman, manager of the Builders Sand Co., Wichita, Kansas, died at Kansas City, Mo., July 20; he was 73.

In 1911, Eshelman and N. C. Dunn of Arkansas City, organized the Arkansas River Sand Co. at Oxford. After the company was sold in 1928, Eshelman moved to Wichita to manage the Consumers Sand Co. branch.

Melville G. Kerr, 66, died August 21 in Detroit. Mr. Kerr was associated with the Ohio Gravel Co., Cincinnati, and vice president and director of the American Aggregates Co., Detroit.

Hans Helmuth Nikolaj Krarup, 83, died recently in Encino, Calif. He was a recognized technical authority on cement manufacture. Career included management of several plants of the Ideal Cement Co. He was active in the Portland Cement Association.

NEW CAT DW20 4-wheel, 345 HP Series G Tractor with 24 cu. yd. No. 482 Scraper

NEW CAT DW21 2-wheel, 345 HP Series G Tractor with 19.5 cu. yd. No. 470 Scraper

NEW CAT No. 619 2-wheel, 225 HP Series B Tractor with 14 cu. yd. No. 442 Scraper

BIG NEW CAT WHEEL RIGS CUT PRODUCTION COSTS

You name the job...these new Cat Wheel Tractors and matching LOWBOWL Scrapers can do it better with faster cycles and greater production, at lower cost. For example:

DW20-DW21 Series G Tractors and matching LOWBOWL Scrapers Now these big wheel tractors develop 345 HP—an increase of 8% over former units. Both tractors have 12% more rimpull than before—the DW20 develops 39,565 lb. (maximum) rimpull, and the DW21 has 49,100 lb. (maximum) rimpull. As a result, the new rigs travel faster (up to 20%) under similar haul road conditions. To accommodate this greater power and capacity, improvements have also been made in transmission and final drive.

Matching the increased horsepower and productivity of the Series G Wheel Tractors are the new No. 456 and No. 470 Series B LOWBOWL Scrapers. Rating is increased 8% to 19.5 cu. yd. struck and 27 cu. yd. heaped. (Rating on the No. 482 is 24 cu. yd. struck and 34 cu. yd. heaped.) Bowl, draft frame and apron are strengthened for greater resistance to tough materials and rugged loading—withstand higher loading stresses.

No. 619 Series B Wheel Tractor and No. 442 Series B LOWBOWL Scraper Here is the latest addition to the Caterpillar line of high-speed earthmoving equipment. This brand-new earthmover is a 14 cu. yd. struck (18 cu. yd. heaped) unit featuring ground-hugging roadability, "years ahead" service-accessibility, and high productivity. The No. 619 has a turbocharged 225 HP engine (and high torque rise), planetary final drives, unit construction, tubeless tires, a swing-away dash, 2-jack steering, and a dry-type air cleaner, providing the design and performance features that insure superior workability on a broad range of applications. All this in the new No. 619-No. 442 unit—plus proved economy over any earthmover of comparable size.

DW15 Series F Wheel Tractor and No. 428 LOWBOWL Scraper Greater strength and productivity in the well-known four-wheel DW15-No. 428. Bevel gear and pinion, differential and front wheel spindles offer increased service life. Machine delivers 200 HP. The big LOWBOWL Scraper handles 13 cu. yd. struck, 18 cu. yd. heaped. Can be unhitched to haul other units.

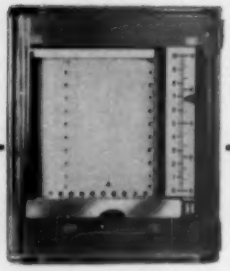
Plan your work around these new Cat Wheel Rigs for top production at lowest cost: The DW20-DW21 Series G, the new No. 619 and the DW15 Series F. The complete facts are at your Caterpillar Dealer. Call him today for a demonstration.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

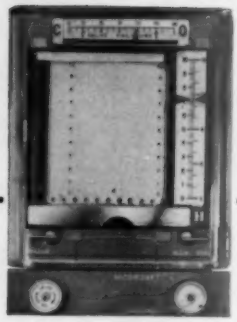
CATERPILLAR

BORN OF RESEARCH
PROVED IN THE FIELD

Exhaust fan and tempering air damper position, cooler exhaust temperature, feeder position and similar variables are precisely indicated on *Tel-O-Set* circular scale indicators. Readable to 0.5% of full scale.



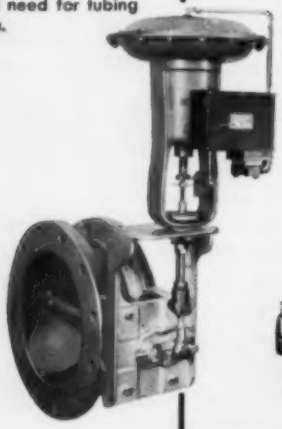
Kiln speed, product temperature, coal mill temperature and cooler bed temperature, as well as other variables, are recorded and indicated by *Tel-O-Set* single and multiple point recorders.



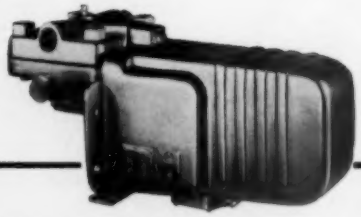
Fuel-air ratio is maintained at point of maximum efficiency by *Tel-O-Set* controller which resets combustion air from fuel requirements and O_2 analysis at the stack.

Remote measurements of temperatures, draft, and other variables are transmitted to the recorder or controller by the *ElectroniX* Electro-Pneumatic Transmitter. Eliminates time lag and need for tubing compensation.

From burner

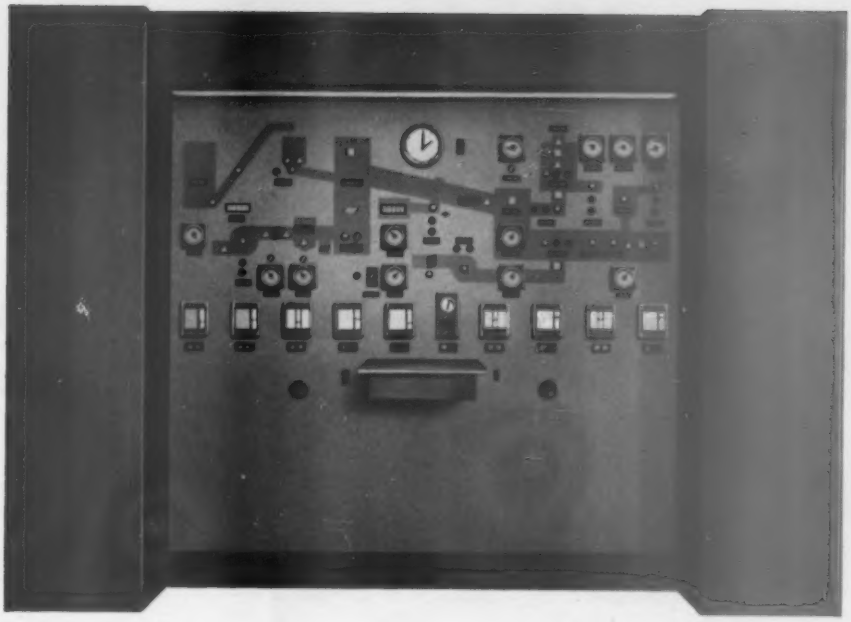


Kiln draft, tempering air, and air to mill dampers are all regulated by this Honeywell valve operator with integral positioner. Also used for cooler, grate speed and draft regulation.



Differential Converter used to measure flows throughout the entire process. Measures directly and transmits pneumatically to the recording and/or controlling instruments on the central control panel.

Product temperature of cement clinker, lime, etc., is detected by *Radiamatic* pyrometers connected to *ElectroniX* instruments . . . which in turn can initiate automatic fuel control.



Graphic instrument panel, with miniature recorders and indicators, makes it easy to control the entire kiln operation from one central point.

to stack

Honeywell instruments keep kilns, calciners, and dryers at top efficiency

High quality . . . uniformity of product . . . low operating costs . . . these are the results when Honeywell instrumentation is used on kilns, calciners, and associated equipment. These instruments measure and control variables from one end of the kiln to the other—temperature, flow, draft, speed and fuel-air ratio.

Honeywell engineers are well qualified to work with producers and equipment manufacturers to develop complete control systems, using these and related instruments and accessories. Custom-designed panels focus the supervision of your kiln operation in a single, integrated control center. For a discussion of your specific requirements, call your local Honeywell field engineer . . . he's as near as your phone.

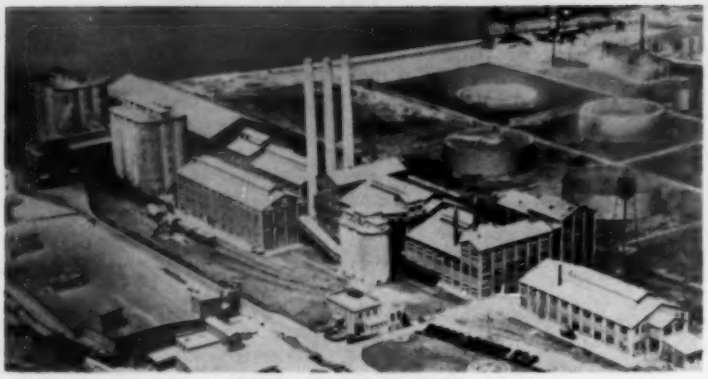
MINNEAPOLIS-HONEYWELL, Wayne and Windrim Avenues, Philadelphia 44, Pa.

Honeywell

H First in Control

Enter 1283 on Reader Card

INDUSTRY NEWS



Cement plant additions at Lone Star, Huron Portland

ENLARGED FACILITIES at the Norfolk, Va., plant of Lone Star Cement Corp. (above) and at Huron Portland Cement Co.'s plant at Alpena, Mich., are in the forefront of industry expansion news.

Lone Star directors have authorized a $6.5-million expenditure for Norfolk which will provide a 1-million-bbl. kiln. This will increase capacity of the plant to 2.3 million bbl. per year.

This latest move comes on the heels of a four-year program—from 1954 to 1958—in which Lone Star invested $82 million to increase capacity. Now, with 15 plants in the U. S. and six in Cuba and South America, its total potential in the Western Hemisphere is 49.1 million bbl.

Growing needs of the Norfolk market area dictated the new expansion. Remarking about the growth of the Virginia-Carolina region, H. A. Sawyer, Lone Star president, continued, "We are proud to share in this growth, and we plan to continue serving the increasing needs of the region's construction industry."

At Huron Portland Cement Co., finished grind capacity is being increased 15 percent, said Charles M. Adams, vice president in charge of operations. The new mill, expected to be completed by mid-1960, will add 7,000 bbl. of finish grind to the mill's capacity and bring the plant's daily capacity to 53,000 bbl.

This is the second announcement of expansion at the Alpena mill within a month. Earlier the company, a subsidiary of National Gypsum Co., announced a large harbor development project designed to increase the mill's shipping capacity by an estimated 20 percent. New silos, a new slip, a deeper harbor and new boat loading facilities were included in that project which got under way the end of September. "We are looking forward also," said Mr. Adams, "to a 1.5-million-bbl. increase in kiln expansion within the next two years."

Technique uses radioisotopes to analyze portland cement

BATTELLE MEMORIAL INSTITUTE, Columbus, Ohio, has reported a new radiometric technique to speed up analysis of magnesium oxide in portland cement. Developed in a study of tracer quality-control systems for the Atomic Energy Commission, the technique is said to cut time required for the analysis from 28 hours to less than one hour. Isotope specialists engaged in the AEC-sponsored study included James E. Howes, Jr., Dr. Charles T. Brown, Meyer Pobereskin, Dr. Duane N. Sunderman and Dr. Paul Schall.

The procedure is based on modification of the basic method outlined by American Society for Testing Materials. Deviating from the latter in labeling ammonium monohydrogen phosphate with phosphorus-32, it permits direct determination of the amount of precipitate formed. This also eliminates the time-consuming digestion, filtration, ignition and weighing steps required in conventional analysis. In a concentration range of 5 to 15 mg. of magnesium oxide per 100 ml., accuracy of results have been within .05 percent when results are given as percent magnesium oxide in cement.

NLA reports increase in lime stabilization uses

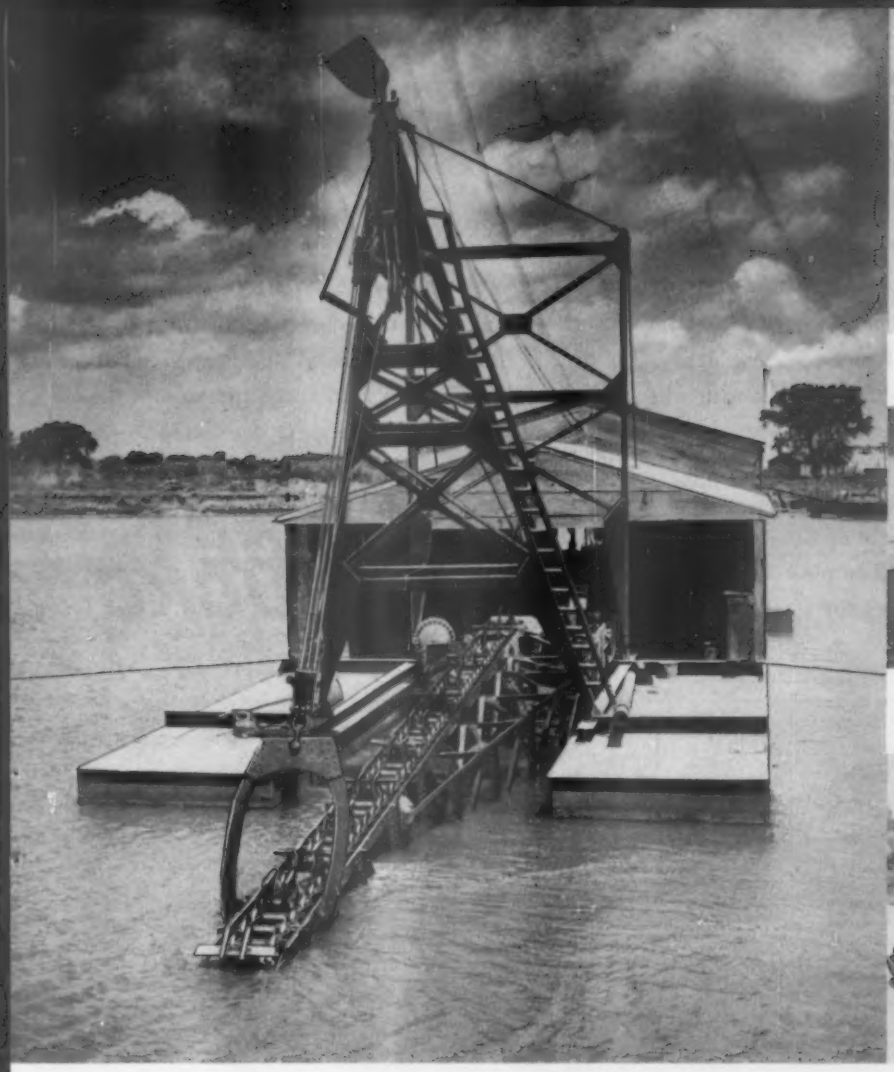
THE PRINCIPLE of lime stabilization is expanding to non-highway uses, according to National Lime Association. Clay subgrade is being stabilized under footings and concrete slab foundations, and lime is being used in building earth dams. At Corpus Christi, Texas, the municipal airport used 12 in. of lime stabilization in clay subgrade.

Canadian cement production gets a giant boost

MIRON & FRERES LTEE., a new Montreal area cement producer, is adding greatly to Canadian production with the opening of its plant, reported to have a 4-million-bbl. annual capacity. The large concrete products and construction firm, formerly a big customer of Canada Cement Co., reportedly has used in excess of 1 million bbl. annually.

The Financial Post, Toronto, in reporting the new plant, said that it is expected to heighten competition greatly, as Canada Cement Co. has an 8-million-bbl. plant in Montreal East. Capacity of the Canadian cement industry has gone up from 17 million bbl. in 1950 to about 42 million bbl. at the present time.

(Continued on page 44)



Cutter bars on the traveling chain of the "Swintek" actually carry nozzle clogging oversize material up the ladder and dump them away from the suction zone.

Eagle Revolving Cutter Head Dredging Ladders recommended for dredging in hard or sticky material which does not cave or disintegrate freely. Ask for Bulletin 156. Eagle also builds complete All-Steel dredges.

users report

BIG INCREASE

in production with an Eagle "Swintek" Dredging Ladder!

A New Jersey operator even reported as much as 400% increase in output—A Kansas producer with three "Swintek" equipped dredges as much as 300%. No producer that has installed an Eagle "Swintek" ever failed to achieve a worthwhile increase in production—much more than enough to justify the cost. The traveling chain of the "Swintek" screens the intake nozzle keeping out boulders and logs—eliminates shut-downs because of clogged lines—protects pump. Cutter bars on the traveling chain agitate the deposit greatly increasing intake of solids—also cut through stratas of clay that ordinary suction cannot penetrate—promotes continual bank caving, relieving dangerous problem of deep under cutting. A size and type for every condition—river or pond dredging. When your pit gets below the water table and you convert to pumping keep the "Swintek" in mind. *Send for Catalog 83.*

SINCE 1872

EIW

EAGLE IRON WORKS

EAGLE IRON WORKS

ENGINEERS • MANUFACTURERS

137 Holcomb Ave., Des Moines, Iowa

NEW FROM DODGE FOR 1960

The thriftiest trucks, in the widest tonnage range, Dodge has ever built . . . including totally new cab-forward models with diesel or gasoline engines.

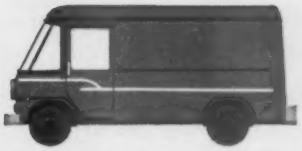
Name your job. There's a Dodge truck to do it. For Dodge has never had a line-up as great as this new 1960 truck platoon. Spirited panels and pick-ups that deliver up to 200 horsepower. Rugged stakes with up to 19,500 lbs. G.V.W. Husky 4-wheel-drive models with wheelbases from 108″ to 174″. All these and more make Dodge your smartest choice for efficient, low-cost hauling. And in the heavyweight class, Dodge introduces a completely new line of cab-forward models, trucks engineered to put real muscle into your biggest jobs, trucks whose new Servi-Swing fenders open with a simple latch and allow you to walk right up to the engine! See your Dodge dealer. He'll be pleased to give you the full Dodge truck story for 1960.

DEPEND ON DODGE TO SAVE YOU MONEY IN TRUCKS

A PRODUCT OF CHRYSLER CORPORATION

"JOB-RATED" FROM 4,250 LBS. G.V.W. TO 76,800 LBS. G.C.W.

SWEPTLINE pick-ups head their class in looks; lead in load space, power. 4-wheel-drive optional.



FORWARD-CONTROL chassis put famous Dodge dependability under the body of your choice.

VAN and other special bodies are easily accommodated by most 1960 Dodge trucks.

TRACTOR models with compact new 89¾" BBC pull longer trailers, bigger legal payloads.

STAKE bodies from 7½′ to 14′ are built by Dodge on models to 19,500 lbs. G.V.W.

TANDEM units provide top hauling strength for dump and other extra-rugged operations.

Enter 1215 on Reader Card

(Continued from page 40)

Statistics point up world growth of cement industry

FIGURES HAVE BEEN compiled by the U. S. Bureau of Mines on world production of hydraulic cement. The information contains revisions of earlier releases and provides comparative data on national outputs, plus a gauge of industrial progress.

World production of hydraulic cement, by countries 1949-53 (average) and 1957-58 in thousand bbl.

	1949-53 (average)	1957	1958
NORTH AMERICA			
Canada	16,834	32,178	32,752
Cuba	2,152	3,917	4,227
Dom. Repub.	580	1,642	1,583
Guatemala	299	575	692
Haiti	——	164	217
Jamaica	516[1]	657	1,044
Mexico	8,795	15,010	15,127
Nicaragua	111	252	235
Panama	416	463	469[2]
Salvador	211[3]	498	510
Trinidad	——	780	879
U.S.	242,597	313,756	326,352
Total	272,511	369,892	384,087
SOUTH AMERICA			
Argentina	9,141	13,861	14,494
Bolivia	221	141	170
Brazil	9,112	19,795	22,099
Chile	3,852	4,263	4,362
Colombia	3,829	7,194	7,200
Ecuador	434	909	938
Paraguay	23[1]	70	41
Peru	2,111	3,201	3,588
Uruguay	1,753	2,445	2,539
Venezuela	3,805	10,243	9,475
Total	34,281	62,122	64,906
EUROPE			
Albania	76	410	457
Austria	7,792	12,483	12,630
Belgium	23,002	27,587	23,787
Bulgaria	3,641	5,160	5,218
Czechoslovakia	12,114	21,530	24,063
Denmark	6,057	6,831	6,239
Finland	4,620	5,547	5,424
France	46,590	73,151	78,650
Germany			
East	10,196	20,287	20,862
West	70,143	112,880	115,964
Greece	2,938	7,183	7,857
Hungary	5,177	5,799	7,270
Iceland	——	——	193
Ireland	2,621	2,650	2,533
Italy	34,441	69,592	75,179
Luxembourg	756	1,114	1,149
Netherlands	4,128	7,740	8,009
Norway	3,917	5,799	6,057
Poland	15,837	26,314	29,551
Portugal	3,788	5,740	6,004
Rumania	7,183	14,195	14,951
Saar	1,372	2,058	1,718
Spain	16,101	29,117	30,829
Sweden	11,902	14,342	14,623
Switzerland	7,429	13,931	12,899
U.S.S.R.	70,688	170,036	195,834
United Kingdom	61,424	71,274	68,601
Yugoslavia	7,335	11,627	11,533
Total	441,268	744,377	788,084
ASIA			
Burma	123	217	211
Ceylon	293[4]	287	469
China	13,251[2]	39,911	58,633
Cyprus	——	399	434
Hong Kong	387	610	891
India	18,147	33,362	36,341
Indonesia	645	1,472	1,741
Iran	334	1,642	2,568
Iraq	504	3,541	3,518[2]
Israel	2,310	4,216	4,181
Japan	35,385	88,981	87,862
Jordan	——	627	668
Korea			
North[2]	1,407	4,104	4,397
Republic	147	539	1,736
Lebanon	1,630	3,283	2,973
Malaya	188[2]	668	633
Pakistan	2,932	6,409	6,391
Philippines	1,648	2,996	3,764
Syria	580	1,847	2,269
Taiwan	2,322	3,541	5,951
Thailand	1,237	2,357	3,025
Turkey	2,515	7,394	8,895
Viet-Nam	1,202	2,052[2]	2,052[2]
Total	87,187	210,455	239,603
AFRICA			
Algeria	2,210	4,169	4,808[2]
Angola	170[2]	762	973
Belgian Congo	1,184	2,721	2,697[2]
Egypt	5,963	8,596	8,865
Ethiopia	41[2]	147	188
Fr. Cameroons	——	64	64
Fr. W. Africa	352	926	874
Kenya	158	1,208	1,272
Morocco			
N. Zone	——	293[2]	293[2]
S. Zone	2,351	2,556	2,298
Mozambique	405	973	973[2]
Nigeria	——	——	663
Rhodesia & Nyasaland, Fed. of			
N. Rhodesia	287[5]	3,858	4,667
S. Rhodesia	950		
Sudan	——	352	381[2]
Tunisia	1,126	2,351	2,023
Uganda	135[3]	504	622
Un. of S. Africa	10,917	14,805	15,948
Total	26,249	44,285	47,609
OCEANIA			
Australia	7,675	13,615	14,418
New Zealand	1,425	3,166	3,289
Total	9,100	16,781	17,707
WORLD TOTAL (estimate)	870,596	1,447,912	1,541,996

(1) Average for 1952-53; (2) Estimate; (3) Average for one year only, as 1953 was the first year of commercial production; (4) Average for 1950-53; (5) Average for 1951-53.

Dewey, American-Marietta call off merger plan

THE RECENTLY ANNOUNCED plan of Dewey Portland Cement Co., Kansas City, Mo., and American-Marietta Co., Chicago, Ill., to merge have been canceled. Boards of directors of both firms determined on that course in separate meetings Friday, October 16.

(Continued on page 48)

"VERSATILE"

IS THE WORD FOR THE NO. 977 TRAXCAVATOR AT THIS WHITE CLAY MINE

"We use our No. 977 with bulldozer to level spoil land, grade roads and clean waste material from the clay. With the bucket, we remove overburden and load the clay—and it outloads our shovel."

The man talking is Assistant Mine Manager A. J. Carpenter of Inter-Chemical Corporation, Hephzibah, Ga. Summing up, he adds: "The No. 977 is a very versatile machine."

"Versatile" is a good word for the Caterpillar No. 977 Traxcavator—and "rugged" is another for a machine that can stand up to tough, all-round work like this day in, day out. Take the main frame, for example. Its integral construction provides rigid support and high load-carrying capacity. Built of heavy steel and welded to form a one-piece unit, it is mounted so that digging loads and stresses are absorbed by the track roller frames.

The No. 977 crowds a full load into its 2¼ cu. yd. bucket on every pass. And it is available with the exclusive Caterpillar Side Dump Bucket, capable of delivering remarkably high production in certain applications. And other attachments can make it the handiest hard worker on your operation.

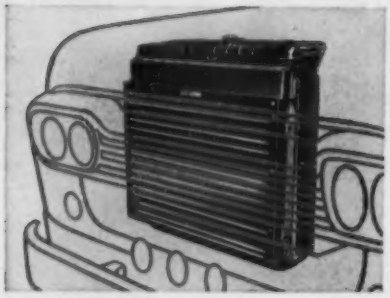
Contact your Caterpillar Dealer and have him bring a No. 977 around. As Mr. Carpenter says: "The Cat Dealer told us what this machine would do. A demonstration showed us the No. 977 would do that and more."

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR

NO. 977...
VERSATILE AND RUGGED

NOW! Certified Durability



CLOSER TEMPERATURE CONTROL obtained with automatic radiator shutters means longer engine life, more efficient operation. Temperature variation between 167° and 187° with shutters as compared to 102° to 181° without shutters was reported and certified in loaded vehicle road tests.

LONGER WIRING HARNESS LIFE is the direct result of Ford's greatly improved electrical wiring system for 1960. Ford's '60 wiring harness and the 1959 wiring harness were subjected to shaker table tests plus constant exposure to oil and water vapors, and temperatures of 200°. Certified test results show a threefold increase in 1960 wiring harness life.

INCREASED FUEL PUMP RELIABILITY is an added benefit from Ford's submerged-type electric fuel pump. Certified results of dynamometer tests showed no vapor lock with Ford's electric pumps at temperatures up to 200°, whereas incipient vapor lock with mechanical fuel pump resulted in a power loss of 9% under same conditions.

It's a fact! Numerous reports from high-mileage operators of Super Duty Trucks attest to Ford's outstanding durability. Studies by an independent research firm provide certified proof that these models are even more durable for 1960.

Ford Super Duty Trucks have earned a reputation for exceptional performance and durability since their introduction two years ago. Shop service records of many leading fleets show Super Duty tractors with mileage readings between 150,000 and 250,000 and no repairs other than normal maintenance. Similar testimony to the dependability of these Big V's by other satisfied users is being added each month. Is it any wonder that '59 sales of these units were more than double those of 1958?

And for 1960, the Ford Super Duties offer additional refinements. Bigger optional axles and increased GVW's to permit greater payloads and more profitable operation. Automatic radiator shutters to keep the engine temperatures within the most efficient operating range, improved submerged-type electric fuel pumps to prevent vapor lock, and redesigned wiring for more reliable operation are typical of the improvements to be found in these units.

The changes offered for 1960 were tested and evaluated by a leading research organization. Certified results of the studies by this impartial firm (name available on request) provide proof that Ford's Super Duty Trucks are even more dependable.

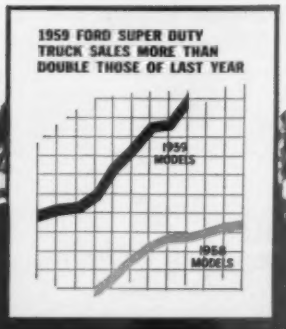
- **Certified Durability through closer temperature control!** Independent research engineers certify that Ford's thermostatically controlled radiator shutters kept water temperature between 167° and 187° in severe mountain grade operation. The test truck with shutters blocked open under same operating conditions had a temperature range from 102° to 181°. The temperature variation of only 20° with shutters means less expansion and contraction in block and heads. Higher, more constant temperatures permit oil to circulate more freely, reducing internal friction. All these factors contribute to longer engine life.

- **Certified Reliability with longer-lived electrical system!** Thicker insulation on wires resists deterioration by heat, oil and gasoline. Asphalt-impregnated loom and plastic-coated mounting clips protect against abrasion. Certified results prove that the 1960 wiring harness has three times longer life.

- **Certified Reliability with Ford's submerged-type electric fuel pump!** Dynamometer tests of engines with submerged-type electric fuel pump and conventional mechanical type showed that vapor lock was non-existent with Ford's electric pumps at temperatures up to 200°, whereas incipient vapor lock with mechanical pump resulted in a power loss of 9% at an underhood temperature of 200°.

Endurance tests were run on alternators, two-speed axle speedometer adapters and other related components with similar results. Get all the facts at your Ford Dealer's now!

in Ford Super Duties!



"Our first Ford C-1000 tractor has logged 190,000 trouble-free miles since March of '58,"

says Robey W. Estes, Vice President and General Manager of Estes Express Lines, Richmond, Va. "We haven't had a single road failure and we only bring it into the shop for regular preventive maintenance work once a month.

"We use the 477 engine and find oil consumption is exceedingly low . . . only one or two quarts added between 3000-mile oil changes. Engine compression at 190,000 miles is still high and fairly equal and our drivers say that power and pep are at about the same level as when the truck had been run only 60,000 miles.

"We are grossing between 52 and 56,800 pounds with our Ford Tilts. They are giving about the same gas economy and better oil mileage than other makes in our fleet. We bought our fourth Ford C-1000 tractor last month and hope to add more soon."

FORD TRUCKS COST LESS

LESS TO OWN . . . LESS TO RUN . . . BUILT TO LAST LONGER, TOO!

Enter 1216 on Reader Card

(Continued from page 44)

Pavement yardage

AWARDS OF CONCRETE PAVEMENT have been classified by Portland Cement Association for the month of September and the first nine months of 1959 as follows:

	Sq. yd. awarded during: September	1st 9 mos.
Roads	2,999,861	41,672,668
Streets and alleys	3,420,109	26,922,546
Airports	283,009	8,520,802
Total	6,702,979	77,116,016

New Yorkers air accidents in effort to improve safety

JUST BEFORE a severe thunderstorm, a crew at a Kingston, N.Y., quarry had put down 15 well drill holes and 17 snakeholes. Lightning struck twice. Several holes went off and some were buried. The next day, the crew searched for the holes and found all but one cap. Warned by the experience, they decided it was dangerous to use caps in well drill holes. Now they use Primacord and MS connectors.

This incident was related by John Kawaske of Callanan Road Improvement Co., South Bethlehem, N.Y., to members of Eastern New York Mineral Aggregates Safety Council, and is typical of matters brought up for discussion at these affairs. Members gave the foregoing problem a good going-over and agreed: It is safer not to use caps in the holes.

Seymour Fleming of New York Trap Rock Corp. conducted the safety review at a recent meeting, when these cases and more were aired: North American Cement Corp.'s Harris Roberts told about a worker who changed a water glass on a boiler. The glass broke and pierced his hand, severing two tendons. In the future, more care will be exercised. The glass will be broken before its removal, and the worker will wear heavy gloves.

Said John Naventi of Lee Lime Corp., Lee, Mass.: A laborer was knocking down a 6-ft. wall. Standing on the wall, he jumped off when the stone started to move. Both heels were broken. Said the members: He should have been working on the ground.

Several matters came up for review and discussion, giving individuals the benefit of the experience and advice of the others, and enabling them to strengthen their safety programs through effective preventive measures.

(Continued on page 50)

SPECIAL REPORT TO CATERPILLAR OWNERS

CAT CATERPILLAR

Parts you can trust.
Dependable round-the-clock service.

CATERPILLAR PARTS ASSEMBLY EXCHANGES LET YOU
TRADE DOWN TIME FOR MORE GO TIME

Here's news about the time-saving, money-saving plan offered by your Caterpillar Dealer. It works this way:

1. Place your order for a parts exchange assembly that is available from dealer stock.
2. Remove your worn assembly and install the reconditioned unit.
3. Send your machine back to work and return the worn unit for credit.

Do-it-yourself repairs to parts assemblies must be weighed against earning losses. What would your equipment earn for you *during the extra time* it takes to repair parts assemblies? You can eliminate earning losses of this type and still pay no premium. Your equipment can actually be making money for you, when otherwise it would be down.

Cat assembly exchange units are guaranteed by your Caterpillar Dealer and can be ready to go on just as soon as the worn assembly is off. The cost? The cost compares favorably with the actual cost had you done the repair work yourself—often less because of the availability of special equipment and serviceman's skill in your dealer's shops.

You can exchange with confidence. When you purchase a Caterpillar Exchange Assembly, you can be sure it's been reconditioned by trained experts using authorized techniques, and only *genuine* Caterpillar parts are used. Every assembly exchange item is backed 100% to be in first-class condition.

Any way you look at it, Cat Parts Assembly Exchange is a good deal. You get a dependable, guaranteed exchange unit at approximately the same cost had you done the job yourself—and the time saved can be converted into cash by having your machine working and earning. Contact your dealer today for his list of Parts Assembly Exchange Units and prices.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

EQUIPMENT RENTAL AVERAGES DURING 1958*
as compiled by Associated Equipment Distributors

CRAWLERS	PER DAY DIRECT DRIVE	PER DAY TORQUE CONVERTER
D9	$296.00	$386.00
D9 w/No. 9A Dozer	367.00	457.00
D9 w/No. 491 Scraper	497.00	507.00
D8	211.00	330.00
D8 w/No. 8A Dozer	270.75	398.25
D8 w/No. 463 Scraper	366.00	485.00
D7	142.00	
D7 w/No. 7A Dozer	188.25	
D7 w/No. 435 Scraper	265.00	
D6	107.00	
D6 w/No. 6A Dozer	148.50	
D6 w/No. 60 Scraper	179.75	
D4	74.75	
D4 w/No. 4A Dozer	109.50	
D4 w/No. 40 Scraper	113.40	

MOTOR GRADERS	PER DAY
No. 14	$138.00
No. 14 w/Scarifier Attach.	149.00
No. 12	117.00
No. 12 w/Scarifier Attach.	125.75
No. 112	93.00
No. 112 w/Scarifier Attach.	110.85
WHEEL TRACTORS w/2-WHEEL SCRAPER	
DW21-No. 470	$382.00
DW20-No. 456	482.00
DW15-No. 428	205.00
TRACTOR LOADERS, FRONT END LOAD and DUMP	
No. 977	$199.00
No. 955	108.00
No. 933	85.75

*Figures are national average rates and in no way reflect the going rate in any area, and cannot be so used. Actual rental costs vary depending on local practices and conditions.

SERVICE TIP

BEFORE you begin to tear down your equipment to remove a parts assembly, check with your Caterpillar Dealer on availability and delivery. The big advantage of Parts Assembly Exchange is in having the reconditioned unit ready to go on as soon as the worn one is off.

CATERPILLAR

(Continued from page 48)

National Safety Council cites best all-time safety records

LEHIGH PORTLAND CEMENT CO.'S Oglesby, Ill., plant takes honors for the cement industry in the United States for the best all-time safety record, according to Accident Facts. In the 1959 edition of the book, published by National Safety Council, the Lehigh plant is credited with 5,487,376 continuous man-hours worked without a disabling injury.

First place in the quarrying category was merited by U. S. Steel Corp.'s Michigan Limestone Division. Its calcite plant at Rogers City, Mich., worked 2,551,692 man-hours without injury.

Westvaco evaluates methods of transporting phosphate

WESTVACO MINERAL PRODUCTS DIVISION of Food Machinery and Chemical Corp. is studying several methods for transporting phosphate shale from its Gay Mine on the Fort Hall Reservation near Pocatello, Idaho. According to Fred S. Rooney, plant manager, high railroad freight charges—80 cents per ton—prompted the investigation. "We hauled a million tons of shale last year," he said. "That's a freight cost of $800,000."

One of the methods the company is considering is pumping a shale slurry through a pipeline. This method of transportation has been used in moving gilsonite in Colorado and coal in Ohio. Also being considered is truck haulage and use of a conveyor belt system.

Portland cement production

PRODUCTION OF FINISHED portland cement in August 1959, as reported by the U. S. Bureau of Mines, totaled 34.8 million bbl., an increase of 10 percent over August 1958. Mill shipments for the month totaled 36.8 million bbl., an eight-percent increase over August a year ago, and stocks on hand by the month's end, at 28.1 million bbl., were one percent above the year-earlier figure. Clinker production during August 1959 totaled 31.1 million bbl., up 11 percent over August 1958. Production figures were provided by 167 plants in 38 states and Puerto Rico.

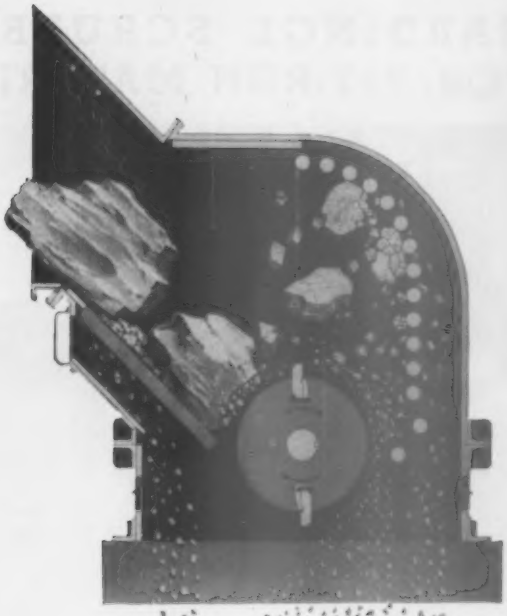
(Continued on page 52)

FOR GREATEST

POSSIBLE

REDUCTION

IN ONE PASS...



THE JEFFREY ROCK BUSTER

24-inch carbon electrodes, 6 feet long, have been fed to this Rock Buster for seven years. Plant engineers are "amazed" at its continued fine performance.

Carbide, always a difficult material to handle, is literally *exploded* by impact in the Jeffrey Rock Buster and made ready for further processing.

Superior in performance and economy, this hard-hitting giant with its high speed impeller bars strikes the material in suspension . . . continues to wallop it until it's broken down to the desired size.

Feed the Rock Buster large, friable, non-abrasive materials and they're quickly reduced to a product of market size. (No wet or sticky materials; that's a job for the Jeffrey Mud Hog.) Size of finished product can be adjusted to meet your various requirements.

Crushing elements are made of manganese steel, enabling them to stand up in the toughest service. For a copy of Bulletin 854 describing the Rock Buster, write The Jeffrey Manufacturing Company, 935 North Fourth Street, Columbus 16, Ohio.

JEFFREY

CONVEYING • PROCESSING • MINING EQUIPMENT . . .
TRANSMISSION MACHINERY . . . CONTRACT MANUFACTURING

Enter 1214 on Reader Card

INDUSTRY NEWS

(Continued from page 50)

Reports how Ideal Cement hiked output, cut fuel use

THE RECENT EXPANSION of Ideal Cement Co.'s Boettcher, Colo., plant is the subject of a technical report being made available by Fuller Co., designers and builders of pneumatic materials handling systems and components. Ideal jacked the plant's capacity from 3,600 to 7,000 bbl. per day while reducing fuel consumption from 1.3 million to 800,000 Btu. per bbl. Emphasis is given to the sampling system for quality control, the use of remote automatic controls, and flexible design features. For copies, write: Fact File ER-3241-3, Fuller Co., Catasauqua, Pennsylvania.

W. E. Graham and Sons Co. acquired by Vulcan Materials

LATEST ACQUISITION of Vulcan Materials Co., Birmingham, Ala., is the Cleveland, N.C., firm, W. E. Graham and Sons. The latter, established more than 50 years ago, has been in the construction and grading business and operates several quarries.

To be known as the W. E. Graham and Sons Division of Vulcan Materials Co., the division will continue under the management of the Graham family. Besides W. E. Graham, four sons are active in the organization: John H., S. Page, W. E., Jr., and Lewis S. Graham.

"Under Vulcan," commented Lewis S. Graham, "we will curtail our grading construction and devote our efforts to quarrying." In addition to its own quarries, the division will operate other properties of Vulcan in North Carolina and Central Virginia, including Piedmont Quarries of Winston-Salem, Pioneer Quarries of Stokesdale and Greystone Granite Quarries of Henderson.

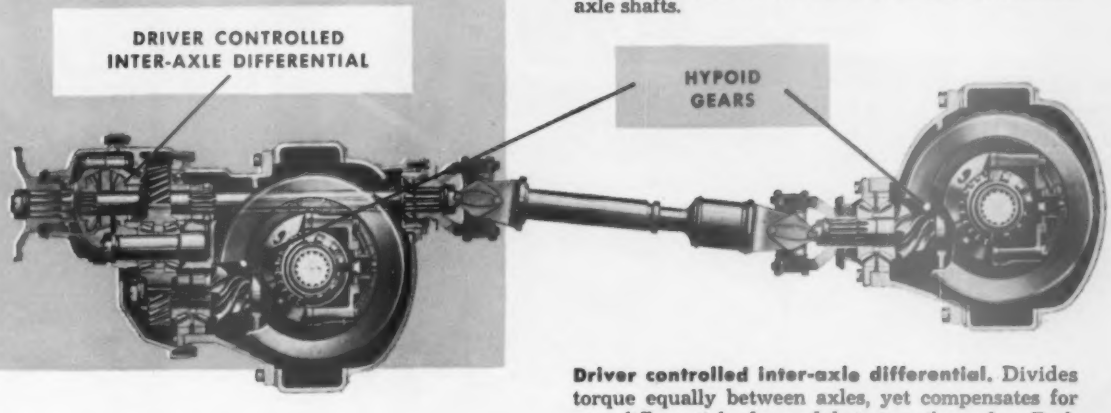
Lee Lime Corp. to enter pozzolanic cement field

LEE LIME CORP., Lee, Mass., is copartner of a newly formed company, Pozament Corp., Bridgeport, Conn. The new firm will produce and market a lime-fly ash and pozzolanic cement, specially designed for concrete block manufacturers. In conjunction with its new venture, Lee has added another rotary kiln to its lime plant.

(Continued on page 56)

Hypoid Single-Reduction Gears Make TIMKEN-DETROIT® LIGHTWEIGHT TANDEMS FIRST CHOICE

for plus-profit payloads!



For more than three years Timken-Detroit Lightweight Tandems with Hypoid Single-Reduction Gears have been *first choice* with over-the-highway operators. Here are some of the reasons why:

Up to 700 lbs. lighter. Lighter in weight than other tandems currently available, Timken-Detroit's efficiency of design is unmatched in the industry. This not only means lower initial cost but *greater revenue from every payload.*

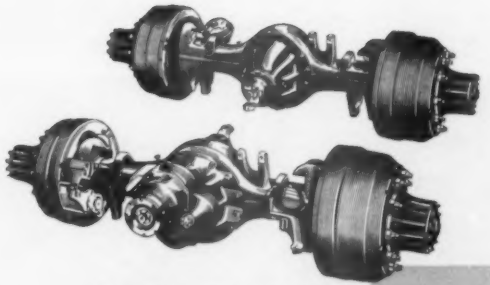
Hypoid gearing. Provides up to 30% more strength than spiral bevel gearing of the same size. Stronger design gives longer life and lower maintenance costs. To match hypoid gear performance, a spiral bevel gear must be larger and heavier.

Widest choice of axle ratios. Because of the stronger hypoid gear set, it is practical to provide high numerical axle ratios up to 8.6 to 1. To provide axle ratios greater than approximately 7 to 1 with spiral bevel gearing, some form of auxiliary ratio multiplication is required. This increases both weight and cost.

"In-Line" through drive. Eliminates compound angles, and reduces drive line wear and maintenance. Differential carriers are centered to permit common axle shafts.

Driver controlled inter-axle differential. Divides torque equally between axles, yet compensates for any differential of speed between the axles. Both axles are always doing equal amounts of work. Can be locked out at any speed when poor traction conditions exist.

Tough, Torsion Flow Axle Shafts Are Best By Any Test. Don't be misled . . . patented Torsion Flow Axle Shafts are still the best available to the American Trucking Industry. Comparison tests prove that Timken-Detroit Axle Shafts, spline diameter for spline diameter, are the toughest ever made.



World's largest manufacturer of axles for trucks, buses and trailers

Another Product of... **ROCKWELL-STANDARD CORPORATION**

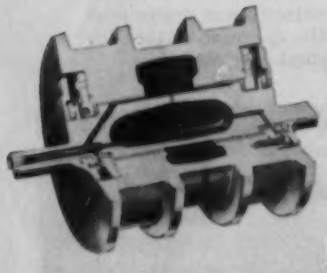
Transmission and Axle Division, Detroit 32, Michigan

Enter 1213 on Reader Card

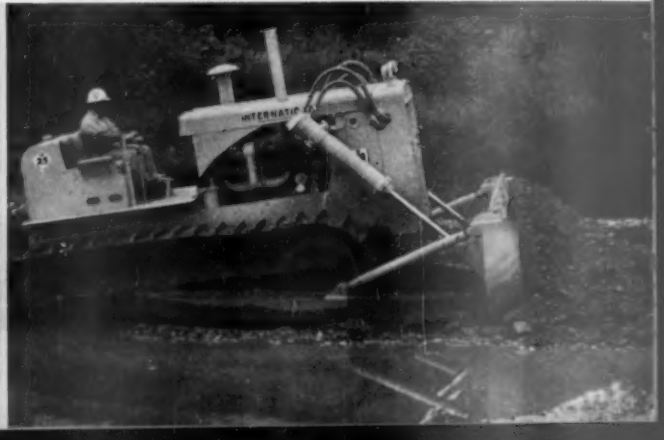
TD-25 power-steering plus

team new 230 diesel hp, new traction..

You "gain ground" on all four steps of the push-loading cycle with the torque-converter TD-25. (1) you slow-down by power-shifting down and using decelerator to get feather-touch contact; (2) power-shift either track up or down to maintain solid pusher contact on curves; (3) get gear-higher kick-outs with on-the-go power-shifting; (4) reposition faster, with higher-than-ordinary reverse!



Dual-protected TD-25 Dura Rollers have precision-fitted, metal-to-metal cartridge-type sealing—to exclude abrasives and retain lubricant. These rollers have pressure relief passages so they can be power-lubricated—without affecting seal life or efficiency. Dura Rollers have king-size lube reservoirs, to make twice-a-year lubing practicall



on-the-go Hi-Lo power-shifting

...to outearn other rigs up to 50%!

You Power-Steer and Power-Shift the new International TD-25, with 2-finger ease! Exclusive, years-proved Planet Power steering gives you full-time "live-track" power and traction to make full-load turns and eliminate "dead-track drag." Hi-Lo on-the-go power shifting instantly matches power to conditions to prevent losing momentum!

Exclusive Efficiency-Range Control

Exclusive International Hi-Lo power shifting makes the TD-25 the industry's only 4-speed torque-converter crawler, and the only one with load-matching, efficiency-range control. In the synchro-mesh transmission TD-25, the Hi-Lo planetary system gives eight speeds forward and reverse—with cycle-speeding up-or-down, on-the-go shifting!

You get big-capacity teamwork of 230 diesel horsepower with the new 7-roller tracks, platformed on super-rugged, double-box-beam frames—and carried on International's new minimum-maintenance Dura Rollers! Over 39 square feet of ground-gripping traction area harness the "25's" great power!

You simply press the direct-start button, to command the "25's" free-breathing diesel horsepower. Dual valving of the "25's" high-torque DT-817 engine provides for peak turbocharging efficiency—to deliver full-rated power from sea level to timberline!

Full performance is at your fingertips, full time. No wonder the TD-25 outearns same-sized clutch-steered crawlers up to 50%—on a wide range of tough jobs!

You don't spill the "pay" part of your load with the TD-25—even when you change speed making the "pass." Hi-Lo on-the-go planetary shifting keeps the blade fully loaded—even when dozing round curves, benching, or side-casting! See how the "25" can help you pocket bigger profits.

SIZE UP TD-25 PLANETARY DRIVE DESIGN that breaks the load-limiting, time-losing steering and shifting bottlenecks—which plague king-sized, clutch-steered crawlers.

COMPARE NEW TD-25 FULL-LOAD, FULL-TIME ABILITY, to outearn other same-sized rigs—up to 50%! Let your International Construction Equipment Distributor demonstrate!

International®
Construction Equipment

International Harvester Co., 180 North Michigan Ave., Chicago 1, Ill.

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers and Bottom-Dump Wagons . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

(Continued from page 52)

Good profit picture seen in third-quarter earnings

GENERALLY FAVORABLE third-quarter earnings were reported by companies in the rock products industries. The following list compares 1959 and 1958 third-quarter net incomes for representative companies, and indicates a percentage of difference in the two periods. Compare these figures with *Wall Street Journal's* compilation of earnings, by industry, for the third quarters of both years: building materials, up 23.2 percent from a year ago, and metals and mining, down 5.7 percent. A total of 246 industrials averaged a gain over 1958's third quarter of 4.7 percent.

COMPANY	3RD QUARTER, 1959	3RD QUARTER, 1958	CHANGE, PERCENT
Allentown P. Cement	$ 990,451	$ 885,137	+13
Alpha P. Cement	3,161,176	2,079,065	+52
American Cement	2,325,533	2,629,107	−13
Am. Pot. & Chem.	1,265,807	954,840	+32.5
Flintkote	4,896,258	4,457,136	+ 8
General P. Cement	3,332,700	3,509,100	− 4.5
Giant P. Cement	1,021,749	703,924	+45
Ideal Cement	6,241,562	6,551,448	− 3.5
Johns-Manville	8,431,000	7,484,000	+11
Keystone P. Cement	709,071	651,065	+10.8
Lehigh P. Cement	5,021,409	3,054,529	+64.4
Marquette Cement	4,148,509	3,506,975	+16
Medusa P. Cement	2,062,100	1,875,659	+ 8
Missouri P. Cement	1,751,968	1,619,321	+ 8
National Gypsum	9,265,182	7,816,976	+18.5
Pacific Cem. & Agg.	774,811	1,114,259	−30.5
Penn-Dixie Cement	3,968,264	3,400,800	+16.7
Permanente Cement	3,213,000	3,399,000	− 5
Pittsburgh Coke & Chem.	291,000	272,000	+14
Ruberoid	1,926,326	1,694,119	+14
Southern Materials	378,000	367,000	+ 2
U. S. Gypsum	13,316,982	12,625,606	+ 5

Crushed stone industry's safety leaders named

THE CLINTON POINT, N.Y., quarry of New York Trap Rock Corp. was named national winner of the Explosives Engineer 1958 safety award for the second consecutive year. The U. S. Bureau of Mines, announcing the winner, said that the Clinton Point record of 336,330 man-hours without a lost-time accident was the best reported by 97 crushed stone operations participating in the contest. In 1957, the same installation posted a record of 374,800 accident-free man-hours.

For purposes of making awards, the contest is divided into five man-hour groups: Group I, plants working 200,000 or more; Group II, 100,000 to 200,000; Group III, 50,000 to 100,000; Group IV, 30,000 to 50,000; and Group V, 30,000 or less. In addition to Clinton Point, winner in Group I, other winners are: Group II—North Branford No. 7 quarry, New Haven Trap Rock Co.; Group III, Woodleaf quarry, Superior Stone Co.; Group IV, Hickory Quarry, Superior Stone Co.; and Group V, White Haven quarry, The General Crushed Stone Co.

"Treasurelite" is a Montana entry in aggregates field

TREASURE STATE INDUSTRIES, INC., Great Falls, Mont., has gone into the expanded aggregates market with the opening of its new $250,000 plant. Gray shale, abundant north of the city, is fired in a 7 x 120-ft. rotary kiln at 2,100 deg. F. for one hour, then is crushed and screened to three sizes: ¾ to ⅜ in.; ⅜-in. to No. 4 minus, and No. 4 minus to dust.

"We believe that there is a more than ample market for our Treasurelite expanded shale," said J. Brad Seely, plant president, "especially with the growing demand for lightweight block and prestressed beams.

"Our own plants of Montana Concrete Pipe Co. will use shale, replacing Idaho pumice in block, and we will also use Treasurelite in the manufacture of pipe."

(Continued on page 60)

As shale is dumped on the grade, the 4-in-1 instantly changes from big-capacity loader to material-moving bulldozer. The operator simply lifts the clam lip, hydraulically, to switch machine actions. He regulates dozing depth with positive accuracy, using "radius control" of blade. It takes a bonafide, full-size standard dozer to match this capacity!

"Back-Dragging" with exclusive clamshell action, the 4-in-1 reduces time and cost of "dressing" a bank and pulling down "slide" rock. TD-20 shuttle-bar control speeds up back-and-forth cycles on jobs like this. Using clamshell in this position also permits speedy pick-up of stumps or loose materials that give straight buckets trouble.

"Our TD-20 Four-in-One does jobs impossible for regular dozer or loader"

—J. F. Coal Corporation, Summersville, W. Va.

"We have used the 4-in-1 for practically all phases of this work, often doing jobs impossible with regular dozer or loader," reports Russell Patrick, Manager, J. F. Coal Corporation, Summerville, W. Va. Prove to yourself what it means to get four-machine utility—bulldozer, excavator-loader, clamshell, "carry-type scraper"—for one moderate investment. See how this "one-man equipment fleet" cuts operating cost and machinery investment—increases profit. Measure the performance-protection plus value of exclusive, shock-swallowing Hydro-Spring. See your International Drott Distributor for a 4-in-1 demonstration!

Applying its tremendous 43,150 lbs. of pry-over-shoe breakout force, this TD-20 4-in-1 shows how its power speeds heaping the 3 cu. yd. bucket full of shot-rock! The unit is helping build two miles of coal mine rail spur grade, from clearing to completion, in mountain terrain. Owner: J. F. Coal Corporation.

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

INTERNATIONAL HARVESTER

INTERNATIONAL®
DROTT

Indiana crushed stone company and a new approach to gondola loading

6 yd Michigan Tractor Shovel hauls own load... alone replaces standard 5 machine operation

By replacing a ¾ yd swing shovel, two 15 ton dump trucks, a hopper, and a conveyor with *one* Michigan Model 375A Tractor Shovel—this southern Indiana quarry has substantially slashed equipment investment for loading railroad gondola cars.

Not long ago, the firm's president and his superintendent were talking over ways to increase loading efficiency and free some present equipment for work elsewhere. The firm was producing everything from aglime to No. 63 Illinois-size crushed stone. This meant stockpiles were spread out, loading cycles were often 1,000 to 2,000 ft. Switching from one stockpile to another with the swing shovel took valuable time. So did handling the material *three* times (by shovel, truck, and conveyor) in order to move it from stockpile to gondola.

Was there a better way? The company had long been impressed with the operation of their two 2¼ yd Michigan Model 175A Tractor Shovels used for loading trucks. Maybe a bigger Michigan, say with a 6 yd bucket, could replace the shovel-truck-conveyor system they were using? They called their Michigan Distributor.

323 tons/hr over 1,800' cycle

Deeds Equipment Company, Michigan Distributor in Lawrence, Indiana, brought out the big Model 375A, 335 hp Tractor Shovel. This Michigan, its 6 yd bucket and 30,000 lb lift capacity, easily scooped 11-ton loads of ⅜" stone. Travel was made over typical 1,800 ft cycles . . . and the material dumped directly into the railroad gondola cars. Time and again the Michigan made the trip and at the end

of an 8½ hour day, had traveled 85 miles. Output totaled 2,750 tons of crushed stone, loaded into 35 gondolas of the 60 to 75-ton class. And, the Michigan *could* load, *with equal ease*, from any one of the many stockpiles.

Production like this sold company officials on the Model 375A and this new method of gondola loading. Typical output since purchase of the Michigan has averaged 2,500 to 3,000 tons a day. Machine investment for this operation has been cut in half. The swing shovel has been released for stand-by duties and the two trucks put to work hauling to the crusher.

Another phase of the operation has a conveyor loading direct from the crusher into the gondolas on a second spur. "The Michigan is loading out stone faster than this con-

tinuous-flow conveyor," says the supt. "It now loads better than 50% of all rail stone shipments from the plant."

Loads quarry rock too

"Our respect for the Michigan has grown too," the supt adds. "A breakdown of our 3 yd rock shovel in the quarry pit was threatening crusher production 'till we sent the Model 375A down there. It did a competent job, and we've been using it in pit emergencies ever since."

Even has free time for haul road work

The crew learned early that the Model 375A's 25 mph speed could produce free time for itself . . . were quick to experiment with its capabilities as a haul-road maintenance machine. Now, when it isn't busy loading gondolas or trucks, it cruises the firm's 150 acre work area grading and compacting the two miles of access and haul roads. This job was formerly handled by a motor grader and occasionally a tractor-drawn roller.

Looking at the future

The firm's supt says, "After seeing the job the Michigan is doing for us now, and its proven dependability and speed, I believe we're headed for a 60 car-a-day production with the Michigan. This would be just twice what we were doing the old way."

No obligation demonstration

Why not see what a Michigan will do *on your job?* There are eight models to choose from—16 cubic feet to 6 cubic yards, 3,000 to 30,000 lb lift capacities. Pick the model you want to see and call us. We'll be glad to give you a "no obligation" demonstration.

CLARK EQUIPMENT

Michigan is a registered trademark of
CLARK EQUIPMENT COMPANY
Construction Machinery Division
2481 Pipestone Road, Benton Harbor 43, Michigan
In Canada: Canadian Clark, Ltd., St. Thomas, Ontario

INDUSTRY NEWS

(Continued from page 56)

Gypsum output soars

DURING THE SECOND QUARTER of 1959, domestic mines produced 2,834,014 short tons of crude gypsum, announces the Bureau of Mines, U. S. Department of the Interior. This represents 21 percent more than in the second quarter of 1958 and is almost equal to the second-quarter production record established in 1956.

Imports were at an all-time high for a quarter—1,779,692 tons, an increase of 71 percent over the second quarter of 1958. Tonnage of crude gypsum available during the quarter was the highest on record; production of calcined gypsum also reached an all-time high, surpassing the third quarter of 1955, and 29 percent higher than the second quarter of 1958.

Ag-lime use increases

NATIONAL LIMESTONE INSTITUTE determined in a survey of the nation's farmers that 22.8 million tons of agricultural lime were used in 1958. This is a one-percent increase over the 22.5 million tons used the previous year; however, it is just a fraction of the 80 million tons experts say the farms require yearly.

Cargo of Materialite described as largest

A 9,000-CU. YD. CARGO of Materialite, the expanded shale aggregate produced at the Ottawa, Ill., plant of Material Service Co., was shipped from Chicago to Spring Lake, Mich. It was said to be the first time that an entire boat load of such a material had been shipped in the United States.

Traveling on the ship "Marquis Roen," the aggregate was transported to Chicago from Ottawa on six barges. The giant rail cranes in the picture, situated on the deck of the Marquis Roen, loaded the ship for the trip across the lake.

(Continued on page 62)

Four Michigan Tractor Dozer models are now available . . this 165 hp size, 262 hp, 335 hp, 600 hp.

Rock quarry cuts repair bills 60%

Company records show rubber-tire Michigan Dozer also has reduced cleanup time 50% over track-type machines

"Like many other stone quarries, we sure used to be unhappy about track maintenance," says G. E. McLeer, vice president, Ohio River Stone Co, Prospect, Kentucky. "Rails alone used to cost us hundreds of dollars per year for replacement . . . plus several man-days of labor per change. No more. Our rubber-mounted Model 180 Michigan Tractor Dozer has run a year now. Naturally, no track problems . . . and no tire replacement either. Looks like original treads will last another year easily. Then, we expect to recap . . . and repeat recap. The savings should be at least 60%."

Excellent performance of Michigan Tractor Shovel echoed in Dozer

"Track wear wasn't the only reason we changed over," McLeer continues. "We chose the Michigan *Dozer* because of our excellent experience with our three Model 175A Michigan Tractor *Shovels*. Their all-Clark power trains really stand up. The Dozer's power train does, too. In its year of operation, the dozer has lost maybe 25 working hours—but that's all!

¼ mile move takes 2 minutes

"Production was another of our aims. The Michigan gets around much faster than the crawlers. In emergencies, for instance, we drive it the 20 miles between our two main quarries under its own power. After all, it's got a top speed of 27 mph, with good visibility, good brakes and power steering.

"Moves in any one quarry aren't nearly as long, but they're virtually continuous. Typical ¼-mile trip takes only 2 minutes . . . half to a third of crawler time. And, of course, the saved minutes go into productive work so necessary with increasing production demands.

"Our time studies show the rubber-tired Dozer *moves more material* on almost all jobs too — 50 per cent more when dressing stockpiles than a track-type machine. The reason? The Michigan moves *just as much* with its 10-foot dozer blade *per load*, yet *moves more loads per hour*. Speed advantage is mostly in faster backup, faster shifting. You don't have to stop to change speeds; just move a short-throw lever. No foot-clutching is necessary, ever."

Jack-of-all-jobs

Michigan Model 180 Tractor Dozer is "work-horse" of the main Derby Company quarry. Unit:

1. Takes about ½ hour to clean quarry floor after each shot.
2. Three to four times a day cleans up around two shovels: one on rock, one on stripping. Total work time, about 1½ hours per day.
3. Once a day, cleans spillage from 2 miles of truck roads.
4. Cleans spillage under crushers and aggregate bins.
5. Shapes nine rock stockpiles.
6. Cleans rock and dirt after stripping and before drilling.

Distributor service praised

"If any of our Michigans go down, we call our distributor (Emmett C. Watson Co of Louisville), and his men come right out," says McLeer. "Very seldom do we have to wait for parts and we get good warranty service."

You can get the same fast, low-cost help from *your* Michigan Distributor. Their good service is an important reason for the sale of over 8,000 Michigan rubber-tire units since 1954. Call them soon . . . they're good friends to know.

CLARK EQUIPMENT COMPANY
Construction Machinery Division
2481 Pipestone Road,
Benton Harbor 4, Michigan
In Canada: Canadian Clark, Ltd.,
St. Thomas, Ontario

Michigan is a registered trade-mark of

CLARK® EQUIPMENT

INDUSTRY NEWS

(Continued from page 60)

Aggregates production to double at Ranger plant

AMERICAN AGGREGATE CO. INC., Austin, Texas, is adding new kilns, 10 x 150 ft., that will more than double present capacity. In its present battery of 8 x 85-ft. kilns, production averages 325 carloads per month. The plant employs 55 men in three shifts around the clock. The company, with projected capacity of 812 carloads per month, will continue to grow as the demand for the expanded aggregate increases. Recently it acquired 45 acres of shale deposits from the Texas & Pacific Railroad. An abundance of natural gas and an almost inexhaustible supply of shale provide the plant with plenty of material for growth.

Crushing plant set up to supply highway project

ARROWHEAD LIMESTONE PRODUCTS BRANCH of Rowe Contracting Co. has set up a crushing plant in Milton, Vt., to supply crushed hard limestone for a $2-million highway contract. Capacity is estimated to be in the area of 500 tph. The plant was designed by Bacon-Milroy of New Haven, Conn., and steel erection was handled by Berlin Constructors, Berlin, Conn.

Ranson Rowe III, president of Rowe Contracting Co., is directing the business; Raymond Green, formerly of New Haven Trap Rock Co., is production manager; and Joseph P. (Pat) Reilly, son of the late Pat Reilly, vice president of Rock of Ages, is assistant production manager.

Film on asbestos

"ASBESTOS . . . A MATTER OF TIME" is a new 16-mm. motion picture available on free loan from the U. S. Bureau of Mines, Department of the Interior. At an open-pit mine in Canada, the film follows surface-mining operations, goes underground to show mineral extraction, then shows the ore being processed. Earlier scenes show by animated drawings the geologic development of the ore. The film may be obtained for group showings from Graphic Services, Bureau of Mines, U. S. Department of the Interior, 4800 Forbes Avenue, Pittsburgh 13, Pa. Its production was sponsored by Johns-Manville Corp.

(Continued on page 64)

STRAIGHT DOPE about Bemis Extensible Multiwalls

right from (you'll pardon the expression) the horse's mouth

Who knows best how filled multiwalls handle? . . . what kind of service they will give?

The men who handle them, of course.

So, read these comments about Bemis Extensible Multiwalls by men who know from experience:

Cement plant superintendent:
"These extensible bags are the best paper bags we have ever used. As far as I am concerned, we won't use anything else."

Cement packhouse foreman:
"I caught my men amusing themselves by letting these 'rubber' bags run off the end of the conveyor and bounce on the cement floor. Our regular bags burst on this drop."

Assistant cement packhouse foreman:
"We broke only two bags in two weeks. We don't want anything else."

Assistant cement plant superintendent:
"Sure, we will work with you to improve carloading; but your extensible bags have eliminated our serious customer complaints."

Cement company traffic manager:
"I didn't believe you before, because I have heard exorbitant claims in the past. Now I am sold—we haven't had a serious complaint since we switched to your 'stretch' bag."

Building materials dealer:
"They (extensible bags) feel and handle something like the old cotton sacks. They stand rehandling better than the bags we have been getting. We even have refill bags left over. Whatever it is, we want more."

Those are the voices of experience. But try 'em yourself . . . and prove by your own experience. Call your Bemis Man right away about Extensible Multiwalls.

Bemis

BEMIS BRO. BAG CO.

General Offices—408 Pine Street, St. Louis 2
Sales Offices in Principal Cities

Enter 1212 on Reader Card

CALENDAR

OF COMING EVENTS

1960

January 18-21, 1960
American Road Builders Association, Annual Convention, Netherland Hilton Hotel, Cincinnati, Ohio

January 19-21, 1960
National Limestone Institute, 15th annual meeting, Statler-Hilton Hotel, Washington, D.C.

January 24-28, 1960
Associated Equipment Distributors, Annual Meeting, Conrad Hilton Hotel, Chicago

January 28-29, 1960
Expanded Clay & Shale Association, Annual Meeting, Hotel Roanoke, Va.

February 1-5, 1960
American Society for Testing Materials, Committee Week, Hotel Sherman, Chicago

February 15-19, 1960
National Sand & Gravel Association, Convention & Exposition, Conrad Hilton Hotel & Coliseum, Chicago

February 22-24, 1960
National Crushed Stone Association, Annual Convention & Exposition, Conrad Hiltor. Hotel, Chicago

May 23-25, 1960
National Lime Association, 58th Annual Convention, The Cloisters, Sea Island, Georgia

INDUSTRY NEWS

(Continued from page 62)

September construction shows slight decline

VALUE OF NEW CONSTRUCTION put in place in September, amounting to $5.1 billion, decreased four precent from August; however, it still was seven percent above September 1958.

Normally, September shows little or no change from the preceding month. All types of construction, with three minor exceptions, shared in the decline. Of the total, private construction outlays in September were $3.5 billion, and public construction outlays were $1.56 billion. The physical volume of construction put in place the first eight months of 1959 was estimated at $25.5 billion by the Bureau of the Census.

Phosphate plant purifies gases with new scrubber

ADDITION OF A new scrubbing unit at the Plant City, Fla., plant of Coronet Phosphate Co., a division of Smith-Douglass Co., Inc., now removes virtually all impurities formerly released in gases to the atmosphere, the management announced. R. M. Wilbur, general manager of the division, said the improved scrubber takes out between 97 and 99 percent of the impurities, mostly fluorine. The recovered fluorine is chemically processed and converted into marketable products.

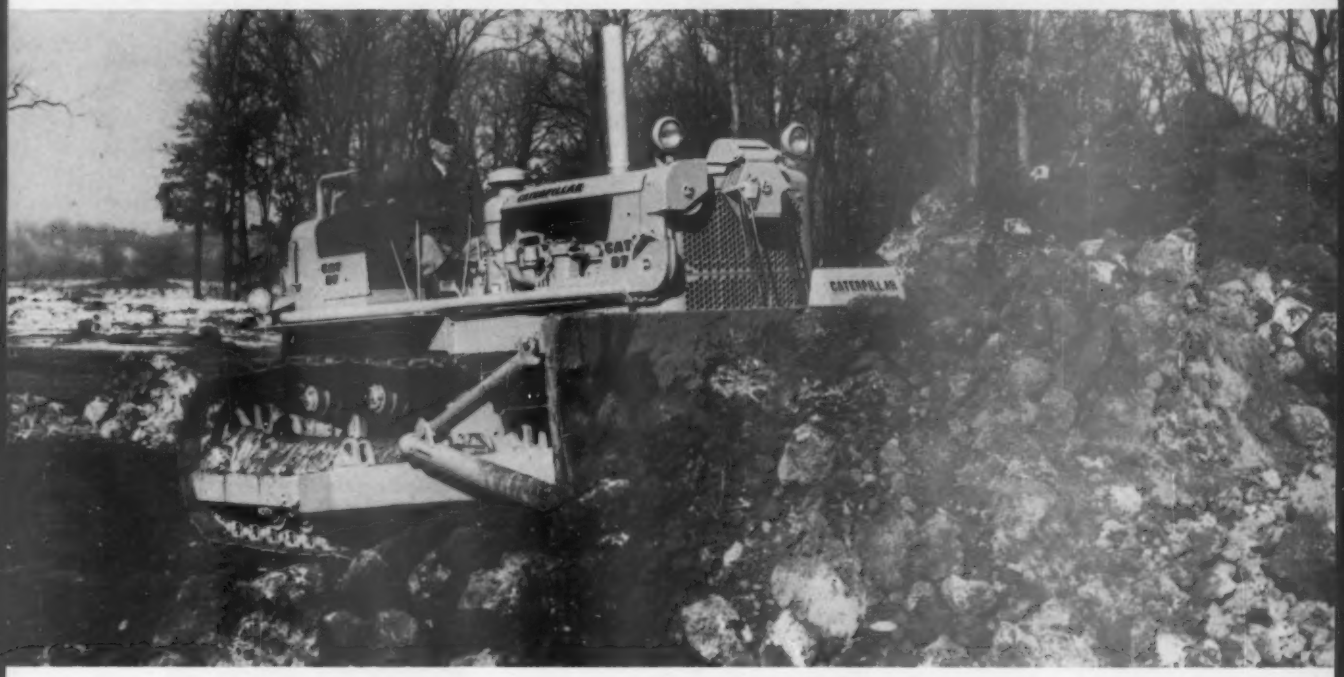
Mr. Wilbur said the recovery system consists of washing the exhaust gas stream four times with high-pressure water sprays to recover the fluorine in solution. Then the gas stream is neutralized so that no free fluorine gas is in gases vented to the atmosphere.

CATERPILLAR'S PROJECT PAYDIRT

PROJECT PAYDIRT* *pays off again*

NEW CAT D7 SERIES D TRACTOR

For higher production at lower operating cost



By ANY comparison the new Cat D7 Series D Tractor is champ in its class. It packs 140 horsepower . . . matched with 80% more lugging ability than the previous model—for greater production. And it delivers this production at lower operating and maintenance costs. The payoff for you . . . increased performance that no other tractor in this power range can match.

Major improvements, developed by Caterpillar's Project Paydirt, affect the engine, power train and undercarriage. And the new Series D retains the exclusive Caterpillar Oil Clutch. It's time-tested; delivers up to 2,000 hours—one whole season—without adjustment.

For complete facts about the leader, see your Caterpillar Dealer. He's ready to give you the whole story on the new D7 Series D. And he'll arrange a demonstration on your job.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

* ***PROJECT PAYDIRT:*** Caterpillar's multi-million-dollar research and development program — to meet the continuing challenge of the greatest construction era in history with the most productive machines ever developed.

NEW ON THE D7 SERIES D

TURBOCHARGED ENGINE features 9% horsepower increase, 80% more tractor lugging ability. Optional in-seat starting is available. The payoff . . . more production!

DRY-TYPE AIR CLEANER removes at least 99.8% of all dirt and dust from engine intake air during every hour. Cleaner can be easily serviced in 5 minutes. Filter element can be re-used. The payoff . . . economical, convenient maintenance and longer engine life.

SERVICE-FREE TRACK ROLLERS, carrier rollers and idlers are lifetime lubricated. New load-carrying design increases roller life. The payoff . . . longer life, no on-the-job lubrication shutdowns.

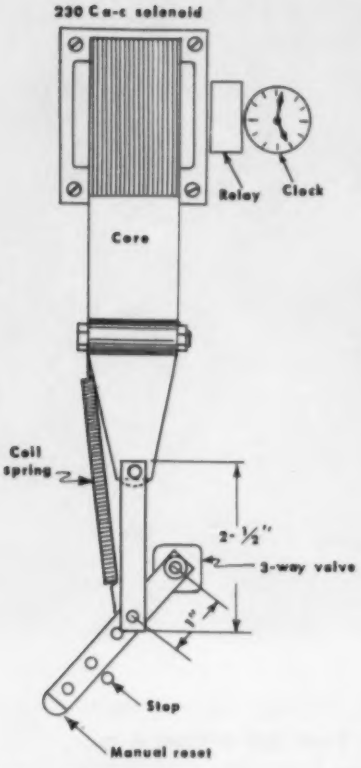
PRESSURE-LUBRICATED POWER TRAIN insures complete circulation of filtered oil to transmission, bevel gear and pinion. To transmit increased power, power train components have greater strength. The payoff . . . longer gear life, trouble-free operation.

CATERPILLAR

BORN OF RESEARCH
PROVED IN THE FIELD

HINTS & HELPS

PROFIT-MAKING IDEAS DEVELOPED BY OPERATING MEN



Diesel fuel system

HEATED HEAVY OIL serves as diesel fuel well enough during warm weather. But even then it is necessary to pay attention to this fuel when the equipment is shut down overnight or over the weekend. For engines equipped with automatic shutoffs, it has been standard practice to switch to lighter fuel at least half an hour before stopping the engine.

But as several producers have discovered, one slip of the memory caused enough inconvenience to justify an automatic control of the fuel. We have seen one device which consisted of an electric clock, relay, a salvaged brake solenoid and a linkage which actuated a 3-way valve. In this way the fuel supply was controlled by the clock.

Paul Ziemke, Clinton, Tenn.

Screen improvements

VIBRATING screen operation is still providing producers with plenty of opportunity to exercise their ingenuity in profitable ways. For example: A western aggregates producer fitted a splitter plate on the top deck of a double-deck vibrating screen. This diverts a certain amount of the oversize right back to a crushing operation, saving a reclaim tunnel and conveyor system under his stockpile of large gravel.

Not content with this arrangement, he made a bifurcated chute under the lower deck and fitted this with a flop gate. Now he can control the amount of fines sent to storage as finished material or sent back to a crusher to make crushed sand. Another ingenious arrangement which saved the cost of a complete reclaim system with an investment of a few dollars in sheet metal fabrication.

Dipper tooth design

A QUARRY SUPERINTENDENT who wouldn't give up has finally made a radical change in the design of dipper teeth. For nearly 50 years this man handforged teeth and watched their performance under the actual operating conditions in his quarry.

The new tooth resembles a duck's bill more than anything else. But with three or four of these odd-shaped teeth on a big dipper, production soars and replacement drops. The flat surfaces of the teeth seem to hold fine rock and present a flat bearing surface to the material under the bucket.

Now that the ingenious idea has been patented, it will be offered as replacement teeth for existing buckets.

Tractor loader attachment

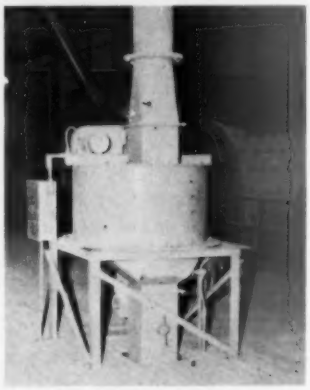
FRONT END LOADERS can be wonderfully flexible and adaptable tools for any ingenious producer. Normally, the units are so busy doing the jobs for which they were designed that there is little opportunity to take them off for other jobs.

But the Arizona Highway Department discovered that their tractor shovel was the answer to a prayer. It was fitted with a long boom with a semi-circular disc welded to the end. This rig is inserted into a culvert, lowered into place, and then withdrawn. The disc brings out all the sand, gravel and debris which was lodged in the culvert during a storm.

This system beats digging out the culvert by hand, and the steel boom is impervious to snakes and scorpions.

Sampling device

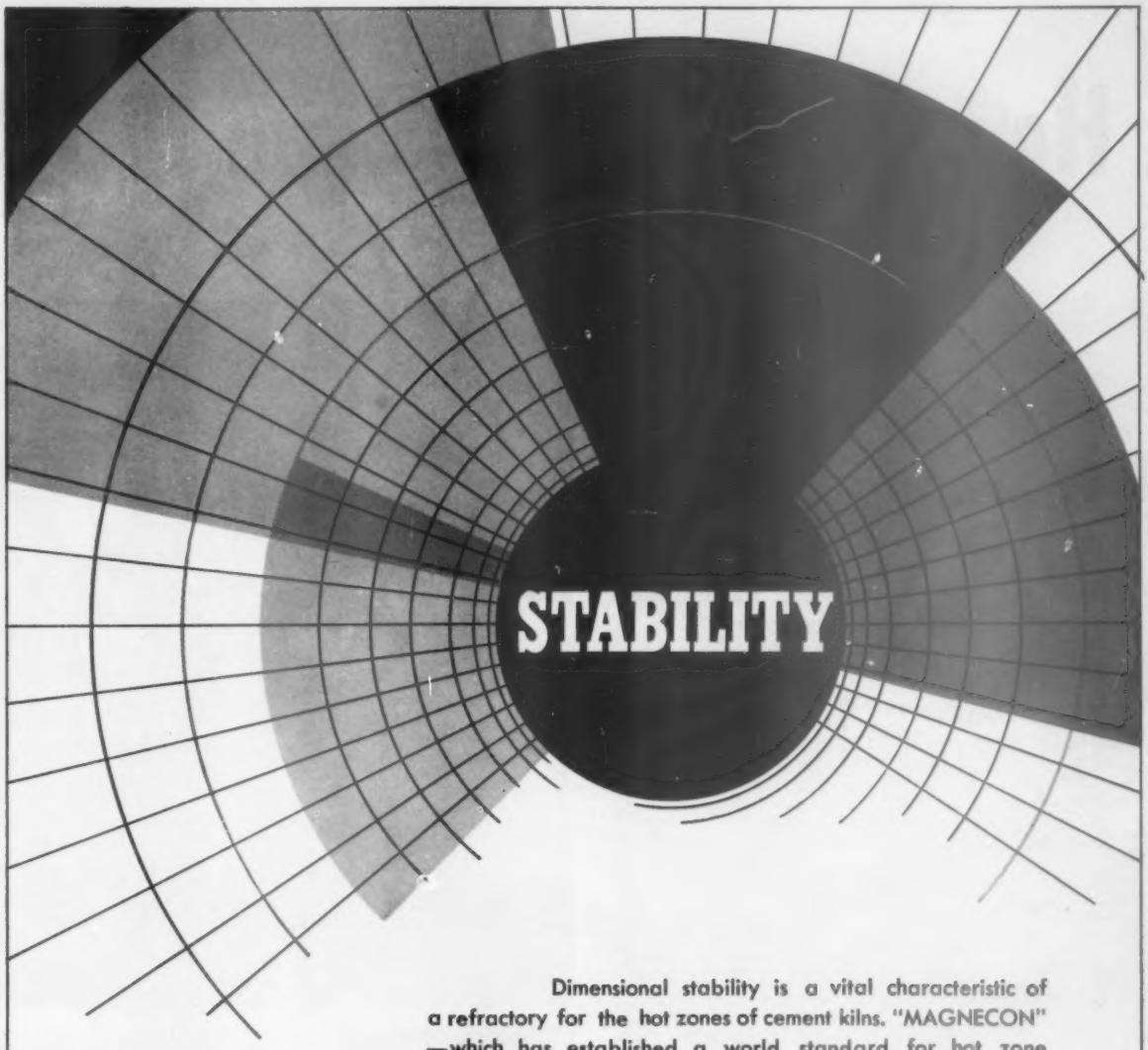
A NUMBER of rock products producers are going to sampling devices and systems. Sampling has been important for a number of years to make sure that material has met minimum



specification. But more producers seem to be using sampling as a process tool.

Quality control is particularly important in cement plants, where large volumes of materials are handled in a number of processing steps. A western cement plant recently put in sampling equipment to check the output of its two clinker grinding mills. The machines take standard-size samples at regular intervals, all ready for the plant chemist to do his work.

(Continued on page 70)



Dimensional stability is a vital characteristic of a refractory for the hot zones of cement kilns. "MAGNECON" —which has established a world standard for hot zone liners—has very high dimensional stability. "MAGNECON" was the refractory selected for seven of the largest cement kilns in the world, all newly completed or still a-building:

Miron Freres, Montreal, Que.
Kiln 550′ x 15′ diameter

Ciments d'Obourg, Obourg, Belgium
Kiln 525′ x 15′ 7″ diameter
Kiln 525′ x 14′ 7″ diameter

Dundee Cement Co., Dundee, Michigan
2 kilns 460′ x 16′ 6″—15′ —16′ 6″ diameter

Ciments Liegeois, Harcourt, Belgium
Kiln 475′ x 13′ diameter
Kiln 510′ x 14′ 5″ diameter

REFRACTORIES

CANADIAN REFRACTORIES LIMITED

CANADA CEMENT BUILDING, MONTREAL, CANADA

1908

Enter 1289 on Reader Card

How AMSCO helps you MOVE

User Reports:

"OVER 13 TIMES MORE SERVICE LIFE ...WITH AMSCO 'MML' ALLOY"

"Working in semi-molten slag at temperatures up to 1800°F.," an AMSCO 'MML' ALLOY dipper front lasted 528 days. That's 13 times more service life than we got from the type previously used . . ,; which gave a maximum of only 40 days' service." AMSCO "MML" ALLOY is a special combination of austenitic manganese steel and molybdenum, specifically developed for applications involving excessive heating as well as severe abrasion.

User Reports:

"AMSCO SIMPLEX TOOTH GIVES 18 WEEKS EXTRA SERVICE"

"We're getting between 15 and 18 weeks extra service by using AMSCO Simplex dipper teeth", reports Mr. Fred Weber, Jr., Vice-President of Vigus Quarries, St. Louis, Missouri. "This gives us almost 4 times the service life we've been getting from standard teeth in our rugged limestone quarrying operation."

Mr. Weber also found that 2-part, reversible Simplex dipper teeth were so much easier and quicker to replace that his shovels were back on the job in no time.

MORE TONS PER DOLLAR

For rugged digging, crushing, pumping, or rebuilding jobs... it pays to ASK for AMSCO!

AMSCO's sole job is to help you fight wear caused by impact and abrasion. AMSCO Manganese Steel—"the toughest steel known"— is today's number one choice for long-lasting dippers, dipper parts, crushers, tractor parts.

AMSCO Alloys, developed to meet unusual wear problems, add extra service life under special and very severe operating conditions.

AMSCO Hardfacing Materials permit economical build-up or repair of worn parts—at a fraction of the cost of new parts. Use this specialized know-how and broad line of "wear-fighting" products to help *your* equipment move more tons per dollar. Ask for AMSCO!

NOW...WELD MANGANESE AS EASILY AS MILD STEEL

"We're getting just the kind of welds and build-up we want with good cost saving to boot," says a user of Nicro•Mang rod. From all over, in a variety of hardfacing applications, reports of success with AMSCO NICRO•MANG are coming in. Users like the stable arc, and wide range of arc length . . . the non-popping, the easy removal of slag . . . and above all the fast build-up. For high strength, superior crack resistance, and easy welding, Nicro•Mang is unbeatable for fabrication and build-up of manganese steel.

"29 YEARS WITH THE SAME 8" AMSCO PUMP"

Haskell Peel, Plant Superintendent at Consolidated Gravel Company, Columbus, Georgia, has shared many experiences with his 8" AMSCO PUMP. One of his favorites is the time that he and his pump almost dried out a lake to recover a sunken dredge. He hooked the 8" AMSCO to more than 1,000 ft. of 10" pipe, and ran it continuously for three days. No wonder the pump is his pet . . . it's been doing the job, pumping 75% sand and 25% gravel, for more than 29 years.

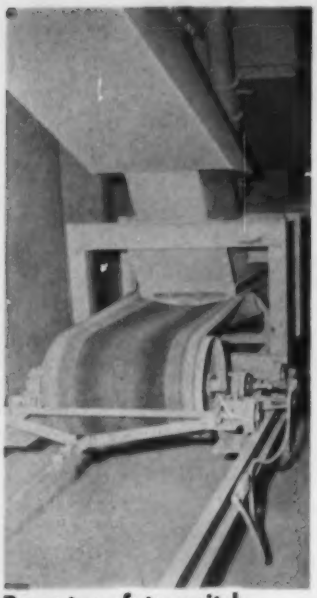
AMERICAN Brake Shoe COMPANY

AMSCO

American Manganese Steel Division • Chicago Heights, Ill.

Other Plants In: Denver • Los Angeles • New Castle, Dela. • Oakland, California • St. Louis
In Canada, Joliette Steel and Manitoba Steel Foundry Divisions
Welding products distributed by Canadian Liquid Air Co., Ltd.

(Continued from page 66)



Remote safety switch

A ZERO-SPEED SWITCH is used frequently on belt conveyors which must work in inaccessible galleries or in remote parts of a producer's plant. But when the tail end of a belt conveyor has a gravity type takeup, it is not always easy to mount.

The electrician of a western cement plant solved the problem by mounting a conduit box about midway in the normal path the takeup travels as the conveyor starts and stops. From this box he led a flexible cable to the zero-speed switch on the extended pulley shaft. This cable flexes in such a small arc during the infrequent moves of the takeup that wear is negligible. It makes a sturdy and almost foolproof connection for the important safety device.

Screen cloth patch

SOMETIMES IT IS NECESSARY to patch or repair a screen cloth. It may have been damaged accidentally when it was installed, worn through in one place or damaged by a heavy rock. Whatever the cause, it is not necessary to discard the cloth for a small break.

A discarded cloth of the same wire gauge or the same opening as the cloth to be repaired is cut a little larger than the hole to be repaired. Strip a wire from each of the four edges—this leaves long wires projecting out on all four sides. Then bend each wire to make it square with the surface of the screen and then fit the piece of cloth over the area to be repaired, making sure that it fits flat.

Finally, bend the wires flat and cinch them securely using a piece of timber as a backup. This should make a screen surface more durable than the original. In fact, several rock products producers use this method to reinforce screen cloths at the point of heaviest wear even before the cloth breaks through.

W. F. Schaphorst, Newark, N. J.

V-belt drive

IT'S NOT ALWAYS necessary to go to the expense of a grooved v-belt pulley for the large diameter wheel. But how is it possible to tell if this work is necessary or not?

A good rule which has been used successfully in rock products plants is this: Subtract the diameter (in inches) of the proposed small pulley from the diameter you expect to use on the larger, and double this number. If the product exceeds the shaft centers of the drive, it will be possible to operate successfully without grooving the larger pulley.

This means that if you have any leeway to set the shaft centers or the pulley diameters, these dimensions can be designed to use a relatively light and inexpensive straight-face pulley in place of a grooved pulley.

W. F. Schaphorst, Newark, N. J.

Conveyor safety

THE DEVELOPMENT of belt conveyor safety devices give a plant engineer the opportunity to use his ingenuity to the fullest.

One engineer for an eastern sand and gravel producer devised a limit switch which would cut the power when the belt skewed out of line enough to trip the switch. These switches, placed on each side of the long belt conveyor, were spaced at regular intervals.

Nylon can be useful

THIS PLASTIC has not been used as widely in the rock products industry as its toughness, durability and flexibility would inuicate. Applications so far have been in the carcasses of tires, hose and electric cable.

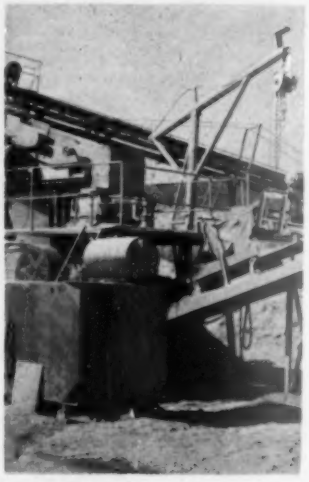
An English cement company discovered that nylon was able to save the day for their filtration system. Cement slurry is passed through a plate press to reduce the water in the mixture to kiln feed consistency. But the cloths which had been used failed rapidly under the pressure of the abrasive slurry.

Then nylon cloths were substituted. Even though they were more costly than other fabrics, their life was many times greater. At the same time, filtration efficiency was stepped up to yield a product around 18 percent final moisture.

Substitute skyhook

MOTORS AND REDUCERS are heavy; screen cloth is awkward to handle. Every producer has his troubles to handle these items safely and quickly. But a western sand and gravel operator went one step further, and decided to make it easy to handle heavy or bulky parts around his conveyors and vibrating screens.

A "hangman's tree" was constructed from locally available tubing. A



hook at the end holds an electrically operated chain hoist—plenty of capacity for a motor. Since the unit swivels, it can take a motor or screen vibrator from a pickup truck and swing it into place with the greatest of ease. The hoist itself lets the operator inch the machinery down into place. END

This shows a portion of one of the year's outstanding conveyor jobs . . . Consumer's Company, Crystal Lake, Illinois.

It's not true that Barber-Greene invented the belt conveyor

. . . but it is true that Barber-Greene introduced the greatest advance in belt conveyors since their invention —*standardization.*

Before Barber-Greene entered the field in 1916, belt conveyors were economical on paper—costly to build. Most installations were tailor-made, involving slow single-unit production . . . expensive field engineering . . . complicated assembly.

Then Barber-Greene developed a unique system of standardized conveyor components that quickly outdated ordinary methods of erection, operation and maintenance. Soon standardized conveyors were known for:

Faster delivery. Packaged units come from dealer stock or are immediately available from the factory.

Low-cost erection. Conveyors get into operation sooner with big savings in engineering costs.

Unmatched flexibility. Interchangeable parts simplify lengthening or shortening of conveyors to meet changing needs.

Today, standardized components are practical for installations of nearly every length, width and capacity. Wherever used, they give a new meaning to conveyor economy, utility and flexibility.

Drives, take-ups and similar units are completely assembled, aligned and adjusted by experts at the factory to assure trouble-free operation.

Write for literature or contact our conveyor division for details on your conveyor problem.

56-39PE

Representatives in Principal Cities of the World

Barber-Greene BG

Main Office and Plant AURORA, ILLINOIS, U.S.A.

Plants in DeKalb, Illinois..Detroit..Canada..England..Brazil..Australia

CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT

Enter 1277 on Reader Card

NOW!

A choice of transmissions

For All-Out Production...

TL-14 with FULL POWER-SHIFT TRANSMISSION

Exclusive single-lever speed and direction control!

You get more than just a full power-shift transmission with the TL-14 TRACTO-LOADER. You get a transmission that is controlled by ONE LEVER — not two or more levers or a combination of levers and foot pedals.

This means no stopping to shift to get into a higher gear. You go into and out of any forward or reverse gear "on-the-go"—from low to second or high instantly, while moving.

And you get a power-shift transmission that is equipped with a torque converter with a big 3.5-to-1 ratio of torque increase at full stall — more than any other loader its size. Means you get the job done — faster, easier — in toughest going.

If you are after all-out production at the pile, if your hauls are long . . . if loading work is scattered and you want to go from one job to another in a hurry — then the TL-14 with a full power-shift transmission can't be beat. A demonstration will convince you.

The TL-14 has MORE of everything! More Reach — dumps right into center of high body trucks. More Carry Capacity — 5,300 lb. More Breakout Force — 18,800 lb. More Power — 86 hp gasoline, 83 hp diesel. And there's a family of six buckets to choose from — 1 to 3 cu yd.

for a wheel loader

For All-Out Savings...
TL-14 with TRACTOMATIC TRANSMISSION
simple design • economical • power-operated

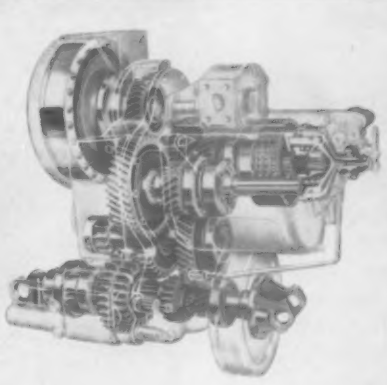
Now you can get a transmission that gives you the ease of operation you want at big savings. The optional TRACTOMATIC transmission for the TL-14 TRACTOLOADER is hydraulically operated and simple in design.

Because there are fewer parts and gears and only two clutches (easy to get at), the price and maintenance of the TRACTOMATIC is considerably less than a full power-shift transmission. This means a lower first cost for the TL-14 . . . lower upkeep, easier servicing throughout its life.

Extensive field tests prove that the TL-14 with a TRACTOMATIC transmission will perform as well or better than other loaders with full power-shift transmissions on short-haul loading and stockpiling.

If you want a good, reliable, easy-operating loader, you can really save money by choosing the TRACTOMATIC transmission for your TL-14. Ask your Allis-Chalmers dealer to show you what it can do. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wis.

FAST, EASY SHIFT — Operator just flips a lever on the steering column to go forward or reverse. Since the reverse speeds are 30 percent faster than forward, you get the extra back-away speed you want without shifting into a higher gear. To get this higher reverse on most other loaders, two separate levers would have to be moved.

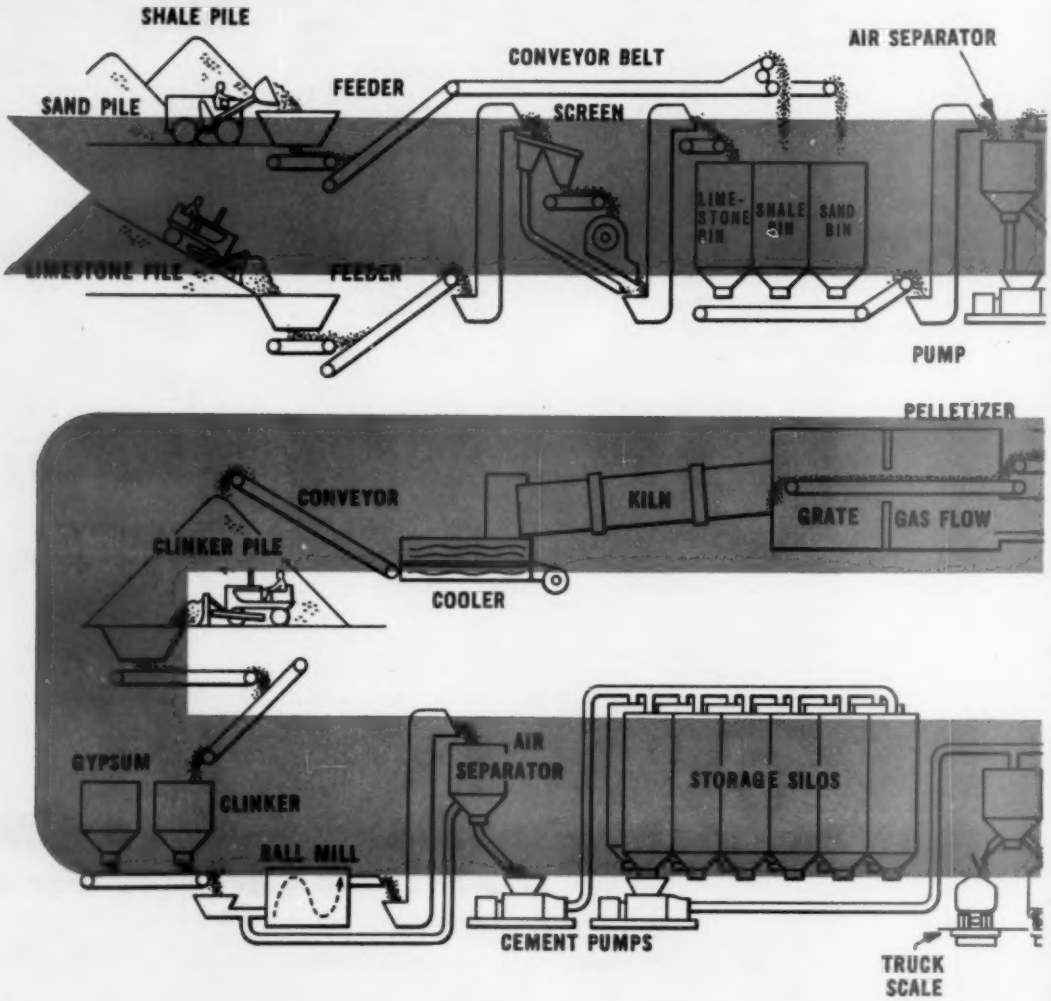


HYDRAULICALLY OPERATED — Note the simple, compact design of the TRACTOMATIC transmission in this cutaway. Two multiple-disc clutches — just outside the transmission — are hydraulically actuated and share the work load. One is for forward, the other reverse. As one works, the other rests and cools — an important contribution to long clutch life. Both are accessible for quick adjustment.

move ahead with ALLIS-CHALMERS
...power for a growing world

Enter 1282 on Reader Card

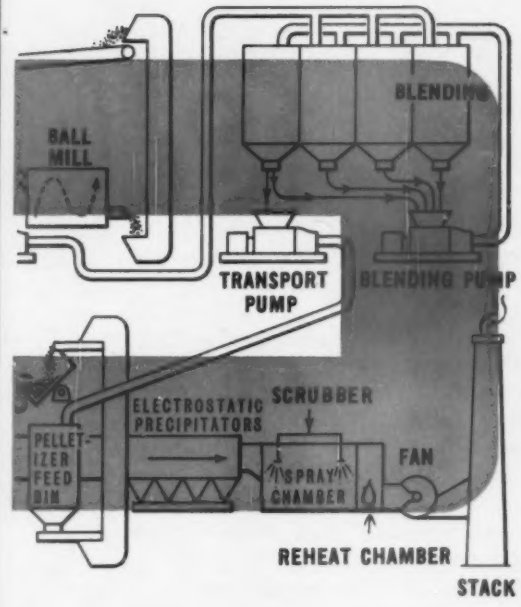
STOCKPILED along the Menominee Canal (above), materials to fuel and feed the Milwaukee plant of Marquette Cement Mfg. Co. will be put through the ACL cement-making process detailed in flowsheet below

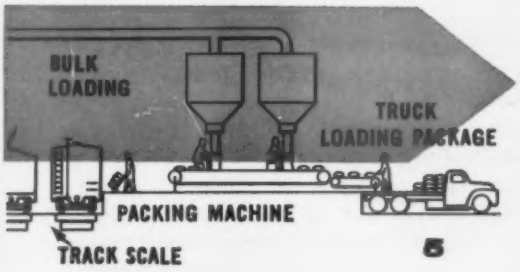


ROCK PRODUCTS
December 1959

ACL cement plant justifies Marquette's choice

by Elwood Meschter





WHEN MARQUETTE CEMENT MFG. CO. chose to place its new $10-million, 1¼-million-bbl. cement plant in downtown Milwaukee, it did so only after a thorough evaluation of the problems—and the advantages. The problems were primarily economic. High taxes, costly real estate, the expenses of transporting raw materials long distances and the necessity to conform to rigid zoning and air-pollution laws all added to the normal cost of making cement. Property taxes alone amount to more than 20 cents a barrel.

But the advantages more than offset the new plant's high-cost items. Because Milwaukee is the heart of a thriving construction market, Marquette absorbs little or nothing in freight costs when it ships cement. Then there are other advantages, too, which offset many of the higher costs. Location on the Menominee Canal enables delivery of all raw materials and fuel by lake boat, one of the most economical means of transportation. These costs are substantially lower than the cost of moving in the equivalent tonnage of finished cement.

This advantage alone, however, did not justify proceeding with the plant which is located on a 10-acre tract close by downtown Milwaukee. It required a compact design capable of producing efficiently and without emission of dust or vapor.

Compact arrangement is essential not only for operating efficiency but to make available as large

Please turn page

ACL CEMENT PLANT JUSTIFIES MARQUETTE'S CHOICE

continued from page 75

an area as possible for storage of raw materials. Because lake shipping is limited to eight or nine months of the year, inventories had to be built up in the late summer to carry over until shipping resumed the following spring. As these stockpiles are depleted during the winter months, the same area is used to stockpile clinker which is built up during the same time.

Key to the effective use of space is the compact grate-kiln system. This arrangement combines high thermal efficiency with low dust loss. The 82-ft. traveling grate and the 175-ft. kiln make a combination only half as long as the kiln in a conventional system for making the same amount of clinker.

This is the first installation in this country of the Allis-Chalmers/Lellep system. The ACL system uses a double pass of kiln exhaust gases to dry, heat and to partially calcine the pelletized raw materials. This adds greatly to the thermal efficiency of the process, and turns out exhaust gases that are relatively cool and dust free.

The new plant has been in operation more than two years. It has taken much of this time to master the precise control of the rather delicate thermal balance of kiln, grate and pellet feed. Evidence of success is the continuous production at an annual rate of 1,325,000 bbl. of clinker with manpower requirement of .114 manhours per bbl. and with fuel consumption of about 640,000 Btu. per bbl. Record production in a single day was 4,900 bbl., at a fuel consumption of 525,000 Btu. per bbl.

A centralized mill department helps to conserve space. The two raw mills and the two finish mills are grouped together in the mill building near the outdoor storage area. All concrete storage silos are grouped together, a space-saving arrangement. Four silos in this group are used to store and blend milled raw materials ahead of the pelletizers. The finished cement silos are arranged to assure simultaneous, rapid shipment of bulk cement by rail or truck, and for shipment of bagged cement by rail or truck. But this shipping procedure is greatly simplified by the need to handle only three types of cement—Type 1, air-entrained and masonry.

Compact arrangement of raw material stockpiles was a design problem in itself. The stockpiles are laid out to make each material readily accessible for two bulldozers and two front-end loaders to manage. Lake boats range in capacity from 7,200 to 9,400 tons and can discharge cargo to the bank of the canal at about 1,000 tph.

Limestone is brought from quarries in northern Michigan where high-calcium rock is available at the water's edge. Raw gypsum and beach sand from Michigan arrive in the same way.

Raw shale comes from Marquette's own quarry at Oglesby, Ill. First shipments to get the new plant operating traveled up the Illinois Waterway system by barge to Chicago where the material was transferred to lake boats for the trip to Milwaukee. Eventually, shale will be brought all the way by self-unloading, canal-lake barges. Crushed and dried shale can be transported economically by rail for the relatively short trip from Oglesby to Milwaukee. This is an alternative routing during the winter or whenever the waterway is closed to shipping.

Bituminous coal from southern Illinois comes to Milwaukee in much the same way—by railroad to Chicago and trans-shipped to lake boat.

Coal, gypsum, shale and masonry limestone are reclaimed from storage with the front-end loaders. Limestone is taken from storage by a bulldozer which pushes it to the boot of a bucket elevator. This unit takes the stone to a belt conveyor distributing system over a pair of 200-ton steel storage bins above the raw mills. If an unusually large amount of plus 1¼-in. stone is received, it is screened and crushed before it is stored. For this purpose, there is a 5 x 12-ft. vibrating screen, a hammermill to reduce the oversize and a bucket elevator to return the material to the distributing system.

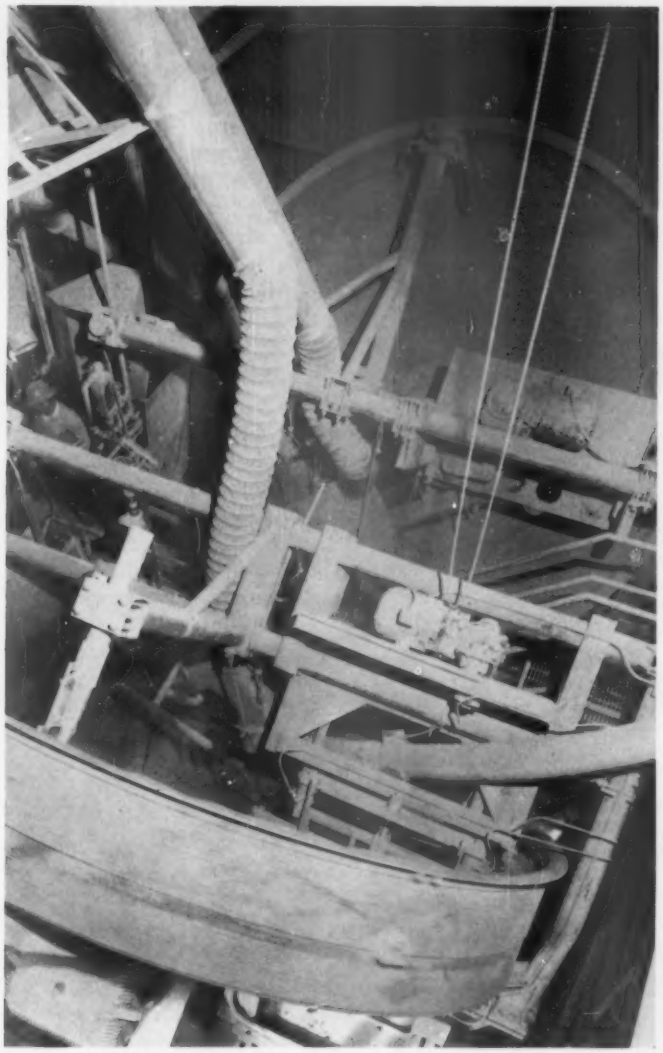
Sand and shale are reclaimed from storage in another belt conveyor system. Front-end loaders keep the materials flowing to fill 90-ton steel storage bins. Since shale is often wet and sticky, it must be handled carefully. It is drawn from storage with a rotary table feeder and dropped to a mud hog that breaks up wet lumps and frozen chunks of shale. Crushed shale drops to a drag chain conveyor which has already been loaded with measured amounts of limestone and sand, drawn from their bins with weighing belt feeders.

Raw materials are measured out in a ratio of 76 percent limestone, 20 percent shale and about 4 percent sand. A bucket elevator lifts these ingredients to the top of an air separator equipped with a hot-air furnace for drying. Here the incoming raw materials are mixed with the fines from the ball mill and are dropped to the mill along with recirculating oversize.

Each of the two 10½ x 17-ft. single-compartment mills is part of a complete, independent ma-

Please turn page

RIGHT: Limestone and gypsum come into the new plant from Michigan in self-unloading lake boats



THE TWO 15-ft. pelletizing pans are face to face

THE TUMBLING ACTION in pelletizers which forms dense pellets for the traveling grate

continued from page 77

terial handling system. Additional flexibility has been provided by making one of the raw mills available to grind clinker to make cement during the peak of the cement-shipping season. Each mill sends its product back to the air separator through an air-slide and bucket elevator. Accepted minus 200-mesh fines are pumped to one of the four blending silos, each holding about 1,360 tons of raw materials for the pelletizing process. In actual practice, only three silos are available to receive fines from the mills; the fourth is on the line supplying the pelletizing bins.

A circulation system blends the stored fine materials. A blending pump draws materials from all four silos at one time, including the one "on the line." The mixture is pumped to only one silo, but as quickly as this is filled, the stream of material is directed to the emptiest of the other three. With this system, incoming materials from the mills are thoroughly mixed with the continuously moving stream. In an emergency, the blending pump can send material direct to the pelletizing department.

Pellet making is a precision process. Not only must the raw materials have the precise analysis for kiln feed, they must make pellets of an exact size and density. At Milwaukee the ideal pellets are between ⅜ and ¾ in. diam. with about 30 percent porosity and 13 percent moisture. With these characteristics the pellets are dense enough to hold their shape while they are taken from the pelletizer and put on the grate. At the same time, they are porous enough to give up water from the center of the pellet as they are dried. It is possible to make pellets so hard that they case-harden and trap water; then they burst from thermal shock when they reach the hot zone of the grate. The range of pellet sizes gives the best pressure conditions on the down-draft traveling grate.

Retention time in the pelletizers controls pellet density. The amount of raw materials fed to each pelletizing pan is controlled by a screw feeder with a variable-speed drive. The other variables which influence pellet production are also controlled, volume of water, rotation speed and degree of inclination. Best operation has been with speed of about 14 rpm. and 55 deg. incline from the horizontal. The self-classifying action of the pan with its two built-up steps brings the larger pellets to the top where they discharge over the rim.

Each of the two pelletizing pans is about 15 ft. diam. and 3 ft. deep with stepped corners instead of a radius. Each pan can be inclined between 50 and 60 deg. and speed can be varied between 6 and 16 rpm. A single control panel permits one man to supervise the operation of both pans. Visual inspection is easy, too, since both pans are placed face to face.

Pellets are checked in the laboratory regularly to make sure that the required chemical analysis is maintained and that the pellets are of proper size and density. Pellet porosity is determined by measuring the force needed to displace the same volume of mercury as occupied by a dry pellet.

Green pellets are taken from the pelletizers on an oscillating belt conveyor which spans the distance to the feed hopper of the traveling grate. This unit swings from side to side, discharging pellets uniformly across the 12½-ft. width of the grate. Normal depth of pellets on the grate is about 7 in., and grate speed is between 40 and 45 in. a minute; but these can be varied to suit burning conditions in the grate and kiln.

Double pass of kiln exhaust gases through the traveling grate is characteristic of the ACL system. This arrangement lets the hottest air come in contact with the hardest and driest pellets. Then the moderated air from this section is introduced to the relatively soft, moist pellets to start the drying action.

First pass uses exhaust gas from the kiln at about 1,800 deg. F. This is pulled downward through the bed of pellets and through a battery of eight cyclone dust collectors with a large, hot-gas fan.

Second pass is the exhaust from the fan which is passed downward through the green pellets at the head end of the grate. The 600 deg. F. air is now only hot enough to dry the pellets rapidly without the hazard of case-hardening.

Dust control is a major feature of the traveling-grate system. Kiln dust is trapped in the bed of hard dry pellets at the first pass. Any dust which escapes is caught in the cyclones and is conveyed to the pelletizing system. Dust and broken pellets that sift down through the ¼ x 2¾ in. slots in the cast iron grates are collected in a drag chain conveyor running the full length of the traveling grate. The conveyor takes this small amount of debris to a bucket elevator at the feed end of the kiln where it is put into the kiln feed chute.

Dust that escapes the cyclones is trapped in the bed of green pellets in the second pass. Final step in dust control is to pass the 250 deg. exhaust gas from this section through an electrostatic precipi-

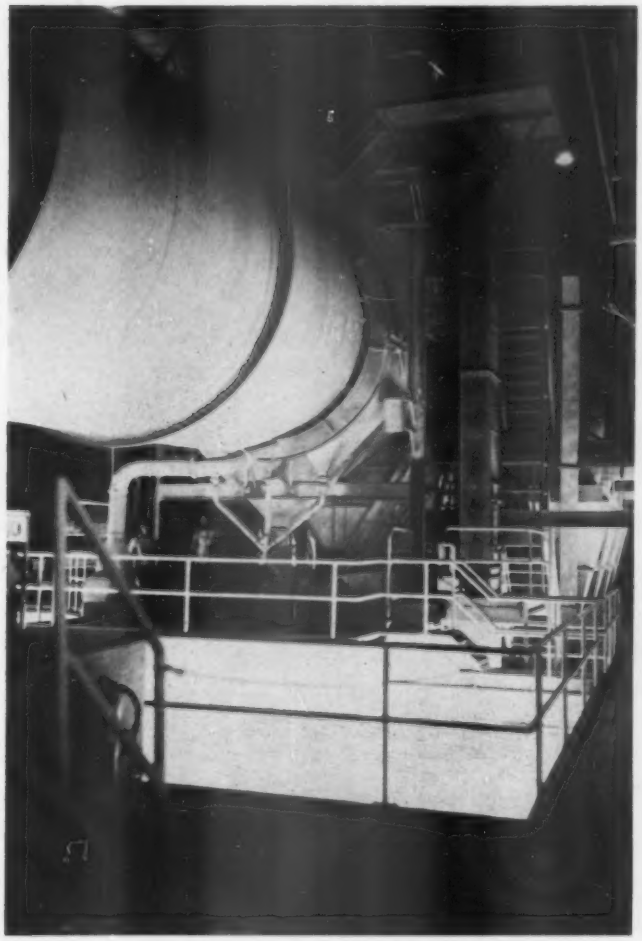
tator where virtually all of the entrained solids are stripped out.

Marquette goes one step further—to vapor control. Since the new plant is in the heart of a metropolitan area, even harmless vapor that merely suggests the presence of dust must be avoided. For this psychological reason alone, a suppressor was installed to eliminate the vapor plume from the stack.

The hot, moisture-laden exhaust gases are passed through a spray chamber. Sprays using about 5,000 gpm. reduce the temperature of the 80,000 cfm. of air at about 250 deg. Since the air reaches the dewpoint inside the spray cabinet, precipitated moisture is collected there and sluiced away. Dehumidified air is reheated and exhausted through the stack. Even with outside temperatures around zero, no vapor plume can form.

Designed primarily for cold-weather operation, this system is by-passed during the summer. But even then, the construction of the stack helps to reduce the formation of an objectionable plume. The 150-ft. concrete stack used lightweight aggregates with a low conductivity factor. This prevents premature chilling of the exhaust air and condensation inside the stack.

Hot, partly calcined pellets are discharged from the 82 ft. long grate into a 13 x 175-ft. coal-fired rotary kiln. This relatively short kiln can be used because so much heat-treatment has been done on the grate. Because the whole system has such high thermal efficiency, clinker can be made using about 640,000 Btu. per bbl. *Please turn page*



LEFT: Feed end of rotary kiln where traveling grate discharges its load of pellets

NUCLEONIC bed depth controller helps to stabilize kiln operation

ACL CEMENT PLANT JUSTIFIES MARQUETTE'S CHOICE

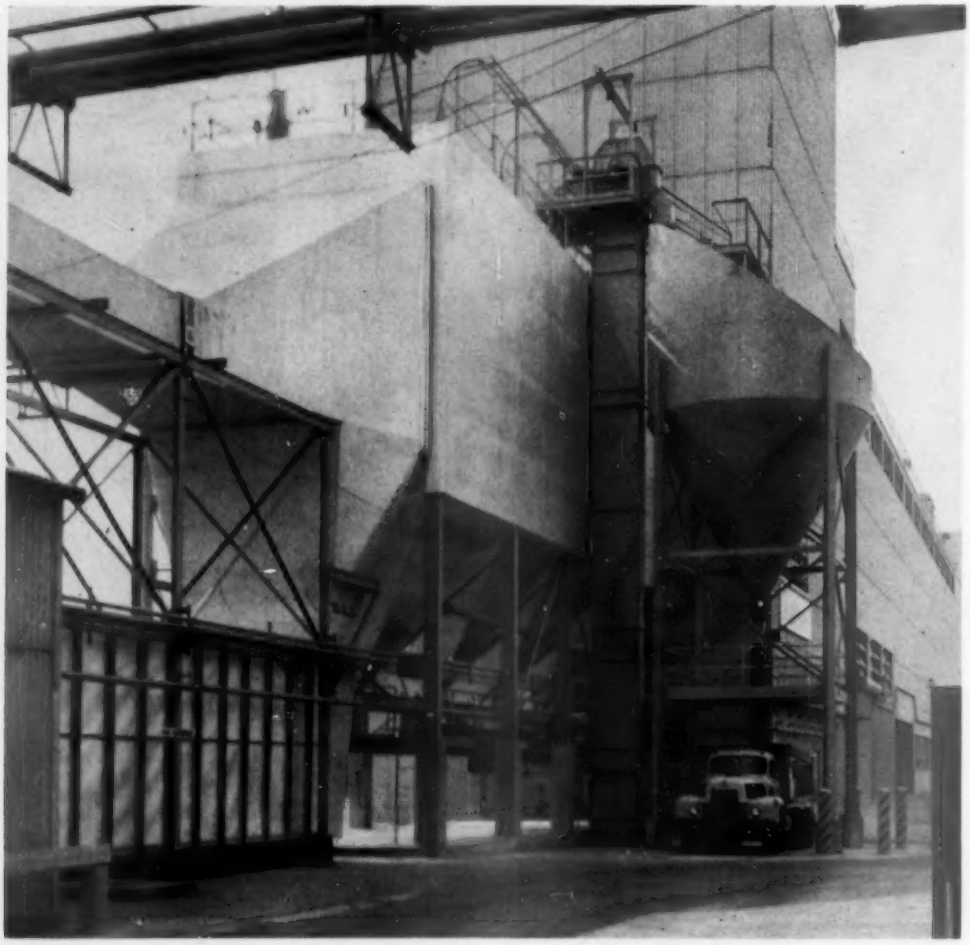
continued from page 79

This short kiln is supported by only two sets of trunnion rollers—this keeps kiln placement and trunnion maintenance problems to a minimum. Manpower is kept low since centralized controls for kiln and grate enable one man to supervise the entire firing system. The operator can change the kiln speed between 29 and 69 rev. per hour to produce between 74 and 174 bbl. of clinker an hour.

Kiln efficiency is improved by using hot air from the clinker cooler. Primary air goes through the coal mill to pick up a stream of fine coal. This air stream is introduced into the kiln through a venturi which can be adjusted by changing air nozzles. This arrangement makes for smoother, more uniform injection of fuel into the kiln. Secondary combustion air is drawn up through the clinker chute, taking on heat as it reduces the clinker temperature from about 2,800 deg. F. to around 2,300 deg. The temperature of this air is held relatively constant by the operation of a nuclear bed-depth control in the clinker cooler.

A gamma ray gauge controls the depth of material in the cooler. Cesium 137 projects a beam of radiation that senses the depth of clinker by striking a Geiger-Mueller monitor. If the bed of clinker gets deeper than desired, the monitor signals for an increase in cooler speed; a thinning bed calls for less speed. In this way the hot clinker maintains a uniform density, a uniform resistance to the penetration of cold air, and a uniform heat transfer from clinker to air.

The 6 x 100-ft. shaking grate cooler discharges



ELECTROSTATIC precipitator and gas scrubber strip out dust and water vapor from kiln exhaust gases

clinker about 90 deg. F. A drag chain conveyor takes the clinker to a belt conveyor system for the trip to mill storage bins or to outside storage. Excess air from the cooler is put through a bank of cyclone dust collectors, and the dust is returned to the clinker system.

Finish mills are 10½ x 17-ft. single-compartment units, duplicates of the raw grinding mills. Gypsum and raw limestone for masonry cement are stored in steel bins above the milling department. Clinker is stored in two 900-bbl. bins. Cement-making materials are withdrawn from storage with weighing belt feeders and delivered to a drag chain conveyor for the trip to the mill.

Each mill has an independent storage and feeding system; each has an elevator and air separator to handle its product. The bucket elevator takes the output from the mill and elevates it to the top of a 16-ft. separator. Oversize is returned to the mill while finished cement is pumped to storage.

Twelve finished-cement storage silos, arranged in two rows of six, hold more than 126,000 bbl. Each row is served with a portable pneumatic pump that moves cement to pack house and to rail or truck loading bins. The pump also maintains a circulating flow of cement, similar to the raw materials system.

Even with a record of producing cement for more than two years, Marquette is continually investigating methods for making cement even more economically. These projects range all the way from improved equipment availability to redesigning the flow of material.

Kiln availability has been running about 85 percent. As the operators explore the full potential of the ACL system, this factor is being moved gradually toward the normal 92 to 96 percent availability for the more conventional kilns. If this increase is achieved, it will pay very handsome dividends.

Raw material protection will make materials handling and grinding much easier. Summer rains and winter snows add a great deal of moisture to all materials stored outdoors. Limestone is increasingly difficult to handle when it is wet; shale even more so. Tarpaulins have been prepared to cover the stockpiles of materials.

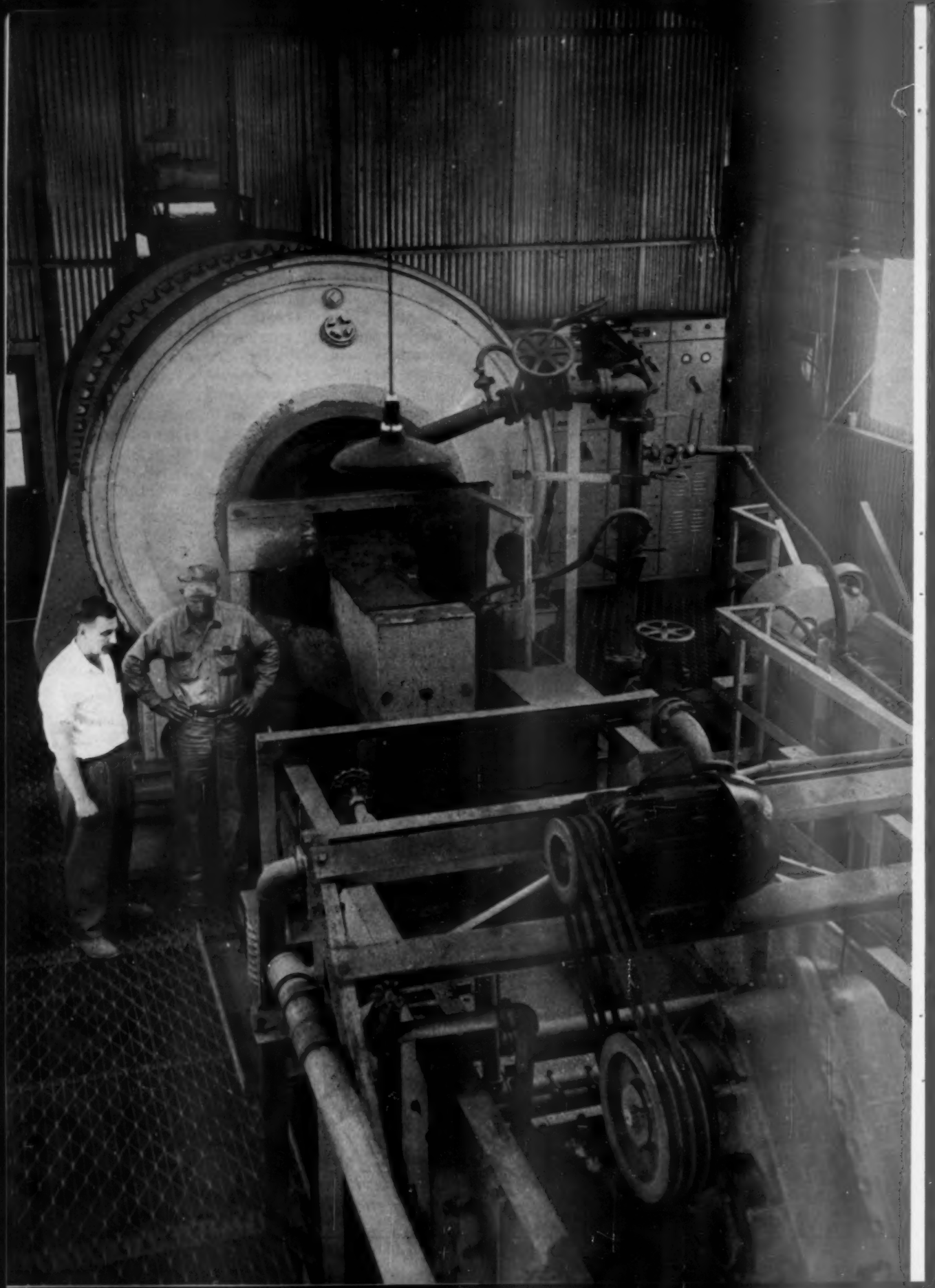
Shale handling is important since even a small amount of moisture will cause it to stick to metal chutes, buckets and chains. The plant operators are experimenting with feeding back dust from collectors above the air separators in the raw grinding department. About 10 to 15 percent of this dust seems to powder-coat the moist, exposed surfaces of the shale to prevent sticking. Since this project has just begun, its success cannot be fully determined until winter weather has set in. Predrying the shale is a project under study.

Shipping efficiency will be improved. New bulk loading facilities including silos, scales and car spotters will shorten the time required to fill trucks and cars, considerably increasing the plant's shipping capacity. Cements will be conveyed from storage silos to the new bulk loading station entirely separate from masonry cement and other products to be sent to the packing plant.

Plant expansion is part of the long-range plan. When the details of plant operation have been mastered, Marquette is looking forward to adding another grate-kiln system. Of course, this plan will depend upon the market for cement in the Milwaukee area developing enough to absorb the added production. **END**

MAJOR EQUIPMENT REFERENCE

Raw Materials Handling:	
Bulldozers (2)	Caterpillar Tractor Co.
Front-end loaders (2)	Clark Equipment Co.
Apron feeders (3)	Chain Belt Co.
Vibrating screen, 5 x 12-ft.	Allis-Chalmers Mfg. Co.
Hammermill	Allis-Chalmers Mfg. Co.
Ball mills (2) 10½ x 17-ft.	Allis-Chalmers Mfg. Co.
Weighing feeders (4)	Merrick Scale Mfg. Co.
Mud hogs (2)	Jeffrey Mfg. Co.
Belt conveyors (2)	Materials Handling Equipment Co.
Screw conveyors (6)	Materials Handling Equipment Co.
Air separators (2) 16-ft.	Combustion Engineering, Inc.
Air heaters (2)	Todd Shipyards Corp.
Pelletizing and Burning:	
Traveling grate, 12½ x 82-ft.	Allis-Chalmers Mfg. Co.
Rotary kiln, 13 x 175 ft.	Allis-Chalmers Mfg. Co.
Air-quench cooler, 6 x 100-ft.	Allis-Chalmers Mfg. Co.
Nuclear bed-depth control	Ohmart Corp.
Cyclone dust collectors (8)	Buell Engineering
Cyclone dust collector, multiclone	Western Precipitation
Electrostatic precipitator	Western Precipitation
Gas washer	J. F. Prichard Co.
Drag chain conveyors (2)	Materials Handling Equipment Co.
Screw conveyors	Materials Handling Equipment Co.
Cement Making:	
Apron feeder, clinker	Chain Belt Co.
Weighing feeders (6)	Merrick Scale Mfg. Co.
Drag chain conveyors	Materials Handling Equipment Co.
Ball mills, (2) 10½ x 17-ft.	Allis-Chalmers Mfg. Co.
Air separators (2) 16-ft.	Combustion Engineering, Inc.
Scales (2) 10 x 50-ft.	Fairbanks, Morse & Co.
Bag packers (2) 4-spout	St. Regis Paper Co.
Bag conveyors (6)	Flexoveyor Mfg. Co.
In entire plant:	
Belt conveyors	Chain Belt Co.
Bucket elevators	Chain Belt Co.
Dust collectors	Northern Blower Co.
Airslides	Fuller Co.
Pneumatic conveyors	Fuller Co.
Motors and transformers	Allis-Chalmers Mfg. Co.
Reducers	Falk Corporation
Plant design and layout	Klug and Smith



Sharp promotion of improved product
widens Columbus market for Jackson Pike Sand & Gravel

HMS SYSTEM OPENS DOORS TO NEW BUSINESS

by Kneeland A. Godfrey, Jr.

HOW MUCH IS HEAVY-MEDIA SEPARATION WORTH to a gravel producer? Jackson Pike Sand & Gravel Co., Columbus, Ohio, can tell you. Since the firm began operation of a 100-tph. prefabricated heavy-media plant in April 1958, it has become able to supply a whole new market.

The market is exposed concrete work—including highways, bridges, airport runways and Corps of Engineers projects. Until its Mobil-Mill was installed, Jackson Pike Sand was limited largely to selling for residential and commercial buildings, where specifications were not strict.

When Federal and State officials learned several years ago that spalling and popping of exposed concrete could be minimized by limiting the deleterious content of concrete aggregates, Jackson Pike and other producers in the North Central states had trouble conforming with the new, tougher specs. which resulted. Many plants in the area have an abundance of materials deposited long ago by glaciers, but containing large amounts of cherts, shales and other soft particles.

When used in exposed concrete, these soft, porous particles absorb water. Freezing in the extreme northern winters, the trapped water expands. After a series of freeze-thaw cycles, the soft particles near the concrete's surface exert such pressure that they literally explode. The pop-outs and spalling which accompanies it weaken the concrete, leaving a scarred surface open to further deterioration caused by traffic and weather.

ENGINEER Tom Mackin and Plant Superintendent Chas. Fowler look over Jackson Pike's neat 100-tph. heavy media plant. Enclosure simplifies maintenance, permits winter operation

The question arose, how should the deleterious materials be eliminated? Many carefully chosen samples from the deposit were analyzed, by processing them through the then-existing Jackson Pike plant, and then through the several beneficiation processes available.

Visits were made to several plants beneficiating gravel, including Killins Gravel Co., Ann Arbor, Mich., which uses a drum-type, heavy-media plant.

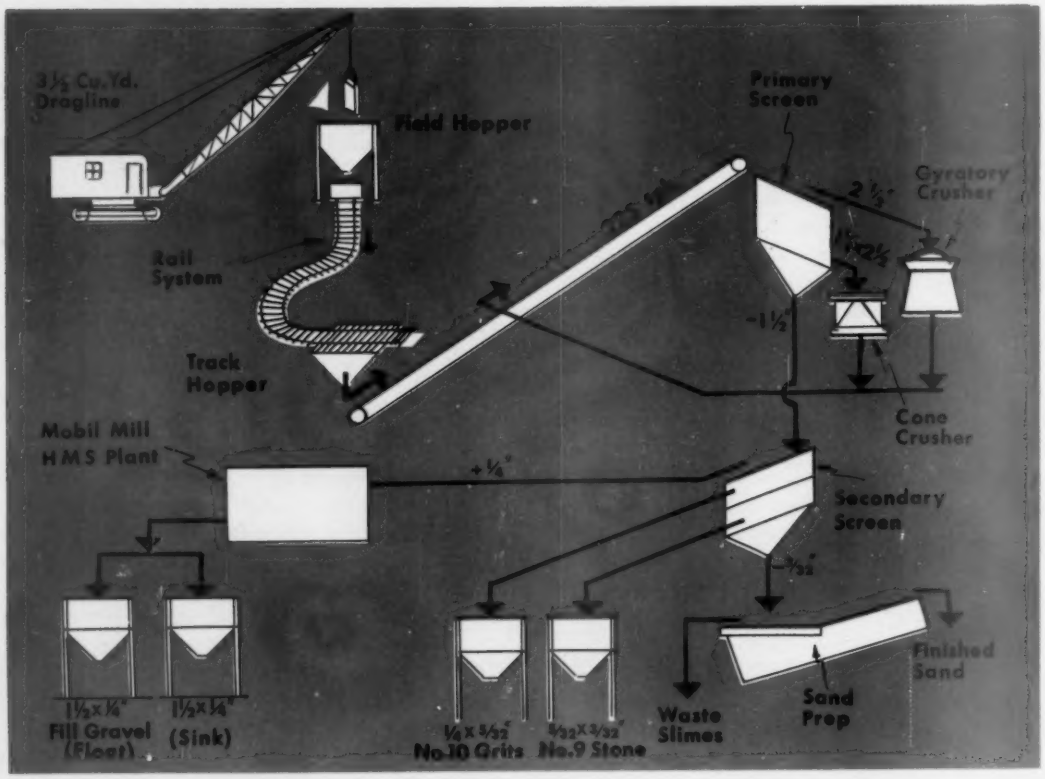
The careful investigation led to the conclusion that the deleterious materials could be removed by heavy-media separation, with the heavy liquid set at specific gravity of 2.50. Although the deposit at Columbus had an appreciable amount of deleterious gravel, typically 9 percent, all the unsound particles were lighter than the sound gravel. So, in November 1957, Jackson Pike purchased a 100-tph. Mobil-Mill heavy-media plant, joining a group of producers, many concentrated in Michigan, using this unit.

Results definitely have been satisfying, reports Secretary-Treasurer Neil Rouse. The plant has cut total deleterious content from 8-12 percent down to less than ½ percent in the 1½ x ¼-in. gravel fraction. Equally dramatic is this fact: Compressive strength of concrete test cylinders made with the improved gravel averages 12 percent higher than with untreated gravel. Finally, as an indicator of this media plant's high efficiency, less than 10 percent of the "float" is sound gravel, reports Engineer Tom Mackin. Working closely with Jackson Pike, Mr. Mackin is an employe of F. W. Sloter, Inc., a ready-mix concrete firm using much of Jackson Pike's production.

The table on the following page shows the excellent results obtained: *Please turn page*

LEFT: At the successful open house, three state highway officials look over samples of float and sink gravel, noting the remarkable difference

BIG 4-cu. yd. dragline boosts output to 200 tph. and digs to full depth of 50-ft. deposit. Note, at right, field hopper mounted over tracks leading to plant



HMS SYSTEM OPENS DOORS TO NEW BUSINESS

continued from page 83

DELETERIOUS CONTENT IN GRAVEL

	Percent in untreated	Percent in beneficiated
Shale	3-6	.3 max
Cherts	2-5	.1 max
Soft clay	.5	0
Decant. loss	1.0 max	0
Typical total	9.	.4

Operation of the unit is extremely simple: A 50-50 combination of ferro-silicon and magnetite in suspension in water forms a separating bath of 2.50 sp. gr. If specific gravity of the bath changes, the operator regulates the amount of media delivered to the separating circuit by moving the densifier screw.

Reject or float portion comprises about 10 percent of the feed. Jackson Pike finds this a saleable product, for its lower weight per cubic yard means it can be sold at the same price per ton as the higher grade gravel.

Ohio highway officials as well as local architects and engineers are impressed with the quality of the media-treated gravel, as evidenced by a rash of specification changes made recently in the Columbus area. For example, revised specs. for a new Ohio State University project read: "Coarse aggregates shall meet all requirements of Ohio State Department of Highways Specification M3.93 (100 percent crushed stone or gravel) or shall have soft and unsound particles removed by an approved specific-gravity separation process."

Mr. Rouse, who manages the plant operations, reports that sales definitely are higher than they would have been without beneficiation. Although in the competitive Columbus-area market the improved material does not command a marked increase in price, current demand for this premium product exceeds production. With this gratifying welcome, and the media plant's low operating cost (under ½-lb. of media consumed per ton of product), the firm has a very encouraging profit picture.

To make sure its investment would pay off, Jackson Pike did a wonderful marketing job on its improved product. This marketing effort, with three high points, went a long way toward boosting sales. First, Jackson Pike put on an open house in July 1958, attended by more than 300 builders, architects and construction material experts. An informative tour of the plant concluded with a satisfying spread of food and refreshments. A clever promotional device was used to emphasize the quality of the new, improved gravel product. Two small, clear vinyl bags of gravel were given to each guest, one containing sink (premium) gravel and the other, float (reject) gravel. The effectiveness of the HMS separation was evident from the marked difference between the two materials in color and clay content.

Second, in November 1958, Jackson Pike hosted producers attending the Convention of the Ohio Sand and Gravel Association, for a plant inspection tour.

Finally, the firm played an important part in a meeting of the Columbus Builders Exchange, with architects, builders and material suppliers in attendance. Engineer Mackin told the group the history of the problem, how beneficiating equipment was chosen and the results obtained with the new Mobil-Mill. The unit's maker, Western Machinery Co., supplied a film showing several Mobil-Mill installations and describing the unit's range of uses. The Columbus Builders Exchange News headlined its meeting report: "Jackson Pike Sand and Sloter put on a terrific meeting," and concluded, "the meeting adjourned in a tone of keen interest and curiosity."

Other changes have helped boost total plant capacity from 125-tph. to a present level of 200 tph. Used for 12 years, the firm's 2-cu. yd. walking dragline was limiting production and getting more costly to maintain. So a 4-cu. yd. crawler dragline was purchased recently. Besides boosting hourly production, it can excavate to the full 50-ft. depth of the deposit, thanks to a long 100-ft. boom.

The final major equipment change was the installation last May of a 54-in. x 30-ft. Sand Prep for dewatering sand output and removing slimes. Impressive in size, the long spiral classifier boosts sand-classifying capacity from 75 to 125-tph. This single unit replaces both a former V-section sand settling tank and a sand drag. As a bonus, it recovers more fines.

Today, with a higher-quality product to boost sales potential, Jackson Pike is in a strong competitive position. And by breaking bottlenecks in extraction capacity, plus sand and gravel producing capacity, the firm is bidding to boost profits through increased sales. **END**

MAJOR EQUIPMENT REFERENCE

Dragline, 4 cu. yd.	Marion Power Shovel Co.
Locomotive, 15 ton	Brookville Locomotive Works
Primary screen, 4 x 8-ft., 2-deck	Iowa Mfg. Co.
Primary gyratory crusher, model 4H	Smith Engineering Works
Secondary cone crusher, 36-in.	Smith Engineering Works
Secondary screen, 5 x 16-ft., 3-deck	Screen Equipment Co.
Heavy-media plant (Mobil-Mill)	Western Machinery Co.
Sand Prep, 54-in. x 30-ft.	Western Machinery Co.

New "tools" slice cement-making costs

by J. M. Wolfe*

HOW CAN WE DECREASE COSTS and raise productivity? Many progressive companies in all branches of the rock products and minerals processing industries have adopted programs aimed at these goals. Those which do not apply systematic methods, or which rely on mere experience to solve them, may get less than the financial results demanded in today's fast-moving economy.

Customers are insisting on new and better products that will be more profitable for them. There is competitive activity directed at satisfying customers' requirements. The improved products that will reduce customers' costs must be manufactured under efficient conditions so that the maker will also derive savings. The need for improved methods in the cement industry and industry in general originates in these pressures.

Processing operations in the minerals industries, which includes cement, consist mainly of long-cycle single-pass operations. These were not, until recently, considered appropriate subjects for the techniques of industry engineering. But effective ways to apply these tools with profitable results to all kinds of work have been devised. Industrial engineering analysis is even applied to operations of a single cycle such as the construction of a new plant. New work is the best application because changes to existing facilities are inconvenient and expensive. This trend has been projected from the assembly line in metal working to the more variable work situations in minerals processing. It is being extended widely for economic reasons.

The mining industry is applying industrial engineering intensively; and many unit processes are analogous to cement plant operations. This industry faces increased labor and materials costs while world prices for metals are depressed. It must maintain profits at high levels to develop new properties and modernize its plants. At the same time, its new minerals deposits often have less metal content. This makes higher costs in research, process development and extraction plant equipment.

Industrial engineering deals with the design, improvement and installation of integrated systems. It correlates men, materials and equipment. Specialized knowledge and skill in engineering, physical sciences and social sciences are required. In addition, the principles and methods of engineering analysis and design are used to predict and evaluate the results. The methods of industrial engineering and research, the orderly, scientific approach to all kinds of problems are now receiving serious attention by managements in the minerals industries.

Industrial engineering is useful in many cement-making operations. The processing operations, the flow of raw and finished materials, the relative location of raw materials, mill, and markets all make the application of industrial engineering techniques profitable. Some cement operations are already using this new engineering tool; others are very likely to follow.

Just as high-grade mineral deposits are disappearing in the metal mining industry, so are the best raw materials deposits for cement making being consumed at a rapid rate. Not only are some of the new sources now being found and developed more difficult to exploit, but they are generally not very close to plant sites and markets. They are not always easily accessible, and they will require considerable ingenuity to be developed economically. Sooner or later these natural disadvantages and cost of transportation will exert their influence on costs. These are among the numerous problems that require analysis in the face of rising costs.

Please turn page

*W. R. Bendy Cement Engineers, St. Louis, Mo.

RIGHT: This cement operation chose to locate close to its supply of high-grade limestone but in a remote desert more than 125 miles from the center of its market area

ABOVE: "Men and machines function together in most operations"

Industrial engineering and scientific management are two new tools for improving methods in the cement industry

THIS CEMENT PLANT in a city is in the middle of its market but gets its raw material by water transport

NEW "TOOLS" SLICE CEMENT-MAKING COSTS

continued from page 87

Larger cement plants give the benefits of mass production to offset higher operating costs and the increasing cost of equipment and construction. However, large-scale production intensifies problems of plant size, volume and complexity, maintenance and special technical skills and, above all—product quality control.

These problems are massive, frequently requiring new techniques and specialized knowledge above and beyond those obtained by experience from conventional methods. Today's pressing problems demand facts to give answers that are accurate. But today's problems are complex; they are less likely to yield satisfactorily to solution solely by superficial examination and judgment. Industrial engineering and scientific management principles are now being applied to eliminating unnecessary work and rearranging the remainder.

Here's how a cement company can apply the techniques of these two fields of knowledge.

First, management must decide on a program for methods improvement. The firm support of all managers and supervisors is essential. If a program is to succeed, these people must understand and approve the principles, tools and procedures, and be aware of the likely changes in operations.

A management-sponsored policy will do much to generate the attitudes and enthusiasms that underlie any project to produce better results. In this way, the more complex problems will be attacked in an atmosphere of collaboration and cooperation. Some companies employ outside consulting engineers to investigate the problems, while others use their own engineering staffs. The main responsibility is to search for the best use of the money, men and equipment that may be available at the moment to carry out the company's functions.

Specific industrial engineering techniques are different for each company, and they must be suitable for company needs. The scope, areas, approach and timing vary in accord with the specific objectives and conditions.

The engineers will survey the physical layout and the equipment available to do the intended work. They try first to improve current methods, because savings here can be realized quickly with the least capital expense for new equipment. If one of the alternative schemes in a particular case indicates great savings but high capital cost or a radical change in method, or the need to retrain operators and revise maintenance practices, the decision is obviously a difficult one. Internal financial conditions and external economic conditions will often govern the decision.

The engineering study involves the preparation of flow-diagrams, process charts and manpower charts, all designed to study the efficiency of existing operations. A careful review of delays, breakdowns, waiting-time, unnecessary steps in an operation and lack of coordination or communications might reveal that better results would be obtained from either a change in sequence, or methods or equipment.

The cement plant generally has several controllable factors: labor, fuel, materials and electrical energy. These constitute the major proportion of high-cost elements that must be reduced.

The order of priority for study will be the area that offers the highest or earliest potential savings, such as the area where production is demonstrably low, or where quality can be improved, or where equipment is small or old. Sometimes a situation appears involving risk of damage to equipment or personal injury to the operators. This, too, must be dealt with promptly.

The areas that offer the best opportunity for greater efficiency in the use of labor are those that involve repetitive or semi-repetitive operations. Power shovel excavation and loading, truck transportation, cement packing and other processing operations under manual control are examples.

Labor improvement should be sought where groups of employes are performing related work or where groups with similar skills are engaged as in maintenance and repair. Men and machines function together in most operations. Sometimes the controlling factor will be the machine, especially when it is too small, too slow or too old to do the job. It may not only fail to do an economic job but may produce undesirable human frustrations as well.

The analysis and studies produced by the investigators must be implemented with some specific action to develop tangible results. Following the changes, there should be a periodic review of results.

When an improvement in methods has been attained, the next step is a time study to fix standard or normal time for executing various jobs, cycles or routines at the work place, or in traveling to and from it, as in haulage. Standards of performance for each task should be established and eventually cover all operations. Then comes the measurement of actual performance of individuals

Please turn to page 121

Although the outlook predicted for metals mining is gloomy, that for nonmetallics is bright and cheerful

AMC maps progress, accents research

THERE WAS PLENTY of both gloom and gladness at the convention of the American Mining Congress in Denver. Most of the speakers predicted a dire outlook for metals mining in the United States. But conversely, the outlook for nonmetallic minerals producers is bright and cheerful.

At a welcoming luncheon, the Governor of Colorado attempted to dispel the official attitude of despair. The Hon. Stephen L. R. McNichols, who has some knowledge of the metals mining problems based on his former connection with the Uranium Ore Producers, offered a three-point program to get and keep the industry on a positive, progressive program. First, a complete inventory of the mineral resources of this country and of all the free world. Second, a world-wide quota system for production of all minerals, reducing or ignoring tariffs and artificial barriers to production and distribution. Last, a government agency to outline ". . . a massive effort of self-help for these vital and . . . languishing industries."

Senator John L. McClellan of Arkansas outlined a potent menace to the mining industry, a superpower teamster's union headed by James R. Hoffa. Since the mineral industries depend heavily upon trucking and other forms of transportation, the creation of a monolithic transportation union would be a real threat to the industry. To correct this situation before it arises, Senator McClellan offered a solution. "Our one alternative. . .would be

Please turn to page 124

Mines Meet Advised 'Accent Research'

By Robert W. Bernick
Tribune Business Editor

DENVER—Greater emphasis on research rather than political action was proposed Tuesday as a solution to some of the woes of U.S. mining.

David C. Minton Jr., vice president of Battelle Memorial Institute, Columbus, Ohio, told the American Mining Congress, "I do not intend to discuss tariffs, quotas, stockpiles, tax reforms, et cetera.

"I merely wish to state that ... to put all your eggs in ... political action for ... erals problem ... political ...

Mine Men Hit Democrats of 86th Congress

The American Mining Congress opened its annual convention in Denver Monday with a blast at the Democratic-controlled 86th Congress, public defense of the Eisenhower administration and an act of faith in the Agriculture Dept.'s barter program.

... panel discussion ... Are Our Na... devel... Montana, chairman of the Senate Interior and Insular Affairs Committee, did not make the opening session as scheduled because of the drive for adjournment in Washington.

AMC Hears Solon Warn Of Peril in Hoffa Plan

By Robert W. Bernick
Tribune Business Editor

DENVER, Sept. 15—Formation of a "super-power" transportation union headed by Teamster boss James R. Hoffa would force Congress to place such a federation under the nation's antitrust laws, Sen. John L. McClellan (D-Ark.) told the American Mining Congress Tuesday.

THE CHA...

Plans P...

U.S. Mining Forecasts Both Gloomy and Glad

(See stories on page 3 also.)

The American Mining Congress heard contrasting predictions of gloom and gladness Monday afternoon about the outlook for markets in strategic metals and industrial minerals.

C. Hyde Lewis, president of the New Idria Mining Co., Idria, ... said the strategic metals ... during two years ...

Henry Dworshak (R) of Idaho, the scheduled chairman, was unable to attend because of the ... congressional adjournment rush in Washington.

Strategic metals virtually have dropped from domestic production and this country is receiving most of its requirements from abroad, Lewis charged.

He said the present national administration was to blame and ...

Steve Tells Mine Group to Plan for Future

By BOB WHEARLEY
Rocky Mountain News Writer

Gov. McNichols Monday prodded the American Mining Congress to stop crying in its beer and start planning for the future.

Addressing a luncheon meeting of 1000 delegates to the group's 1959 Metal Mining and Industrial Minerals Convention, McNichols compared such sessions to "the last gathering of veterans of a war long past."

"I think we need a change in that attitude ... and ...

around a burden of gloom," he said.

"Sometimes, it seems the industry is more interested in contemplating its romantic past than in preparing for its exciting future."

McNichols—who ...

Inventive, practical Simon Zook turns limestone fines into profits with an oil-heated air separator

That waste heap may be valuable!

IT IS DIFFICULT TO IMAGINE anything less valuable than a mass of damp, waste fines from a 1,000-tpd. crushed limestone plant making aggregates. The fines are not wanted in specifications requiring dust-free stone: they are too coarse to qualify as saleable agricultural limestone. But M. Simon Zook, owner and manager of Compass Quarry, looked at his 30-tph. yield of fines and visualized extra profits.

There was a big market for properly sized aglime in the rich farming country near Lancaster, Pa. If the fines could be dried and classified, the investment might pay off. To do this, Mr. Zook bought a 12-ft. air separator with an oil-fired heater—one of very few in the rock products industry outside a cement plant.

Unconventional as it is, the separator has added about 25 percent to the plant's income. About 30 tph. of material is put through the separator, yielding about 5 tph. of aglime with better than 95 percent passing 100 mesh and around 25 tph. of limestone sand between 3/16 in. and 10 mesh. This product finds ready markets among bituminous concrete producers.

Because the raw material is outright damp most of the time and has high moisture practically all of the time, the portable oil burner is essential for continuous, effective operation of the separator. Moisture in the finished products seldom exceeds about two percent now. Chemical analysis of the relatively soft limestone is about 55 percent $CaCO_3$, about 43 percent $MgCO_3$ and two percent SiO_2, an element which often is less than one percent.

Take a look around the plant for other tips on efficient operation. The quarry, for instance, was another area that challenged Mr. Zook's inventiveness. The limestone deposit is heavily seamed and fissured, extremely difficult to drill and to break satisfactorily by blasting. This problem has been partially solved by drilling 15-ft.-deep horizontal blast holes at the bottom of the 35-ft. face.

The charges in these holes seem to lift the face as the 24 vertical holes go off. Each blast usually yields 12 to 14,000 tons of broken limestone, but sometimes more than 17,000 tons have resulted. Oversize is broken with a drop ball until it can be picked up with a 1¼-cu. yd. shovel. Limestone then is put in a 10-cu. yd. truck for the trip to the primary crusher.

A diesel engine provides direct drive at the primary crusher, as elsewhere throughout the plant. There are diesels for the two secondary hammermill crushers further on in the system; there also are a pair of diesels that generate electric power to operate the motors on belt conveyors and vibrating screens.

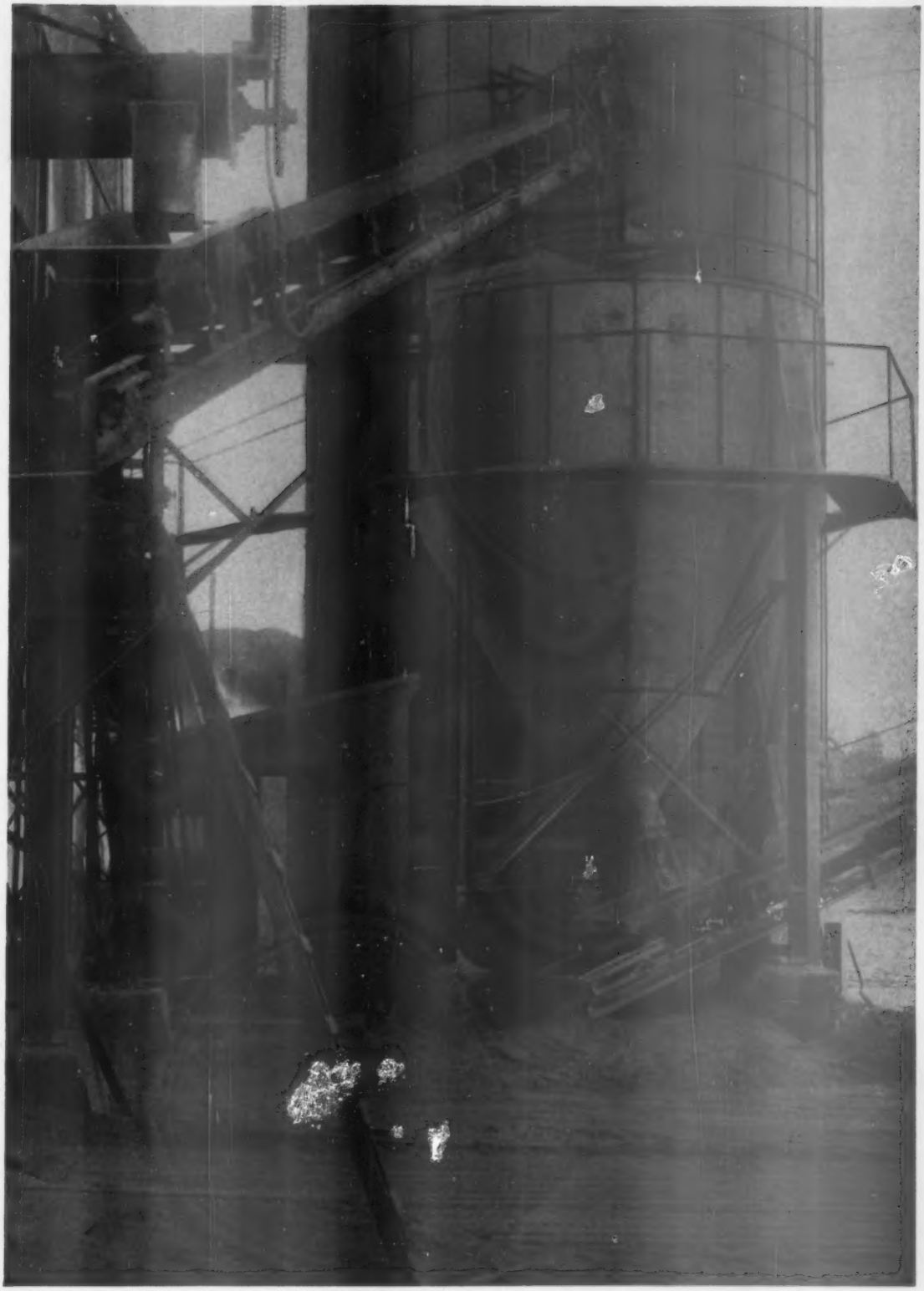
Only plus 2-in. stone from the first vibrating screen is used to make prime aggregates. This size is scalped from the flow of material from the primary crusher on a 4 x 12-ft., double-deck horizontal screen. The lower deck is made up of three sizes of cloth to segregate three products—"dirt" (minus 3/16 in.), 1 x 3/16-in., and 1½ x 1-in. waste stone.

The dirt is a waste fraction, quarry overburden mixed with rock fines, from the blasting and crushing operations. The other two sizes of through-screen rock are available as road-base and fill material; they also can be mixed back into the fines, if desired.

The prime stone taken off by the scalper continues on into a hammermill. It then emerges to be taken to the top of the screening tower for sizing on a 4 x 12-ft., four-deck vibrating screen.

Top deck of this unit usually is fitted with a 1¼-in. screen cloth. From this deck, oversize moves onto the top deck of a small, 3 x 6-ft. vibrating

Please turn page



THE AIR SEPARATOR IN ACTION takes fines from a screw conveyor and belt conveyor and discharges two finished products at the bottom

THE 12-FT. AIR SEPARATOR is in the shadow of the two aglime storage bins. Sized limestone sand is shipped from the square bin

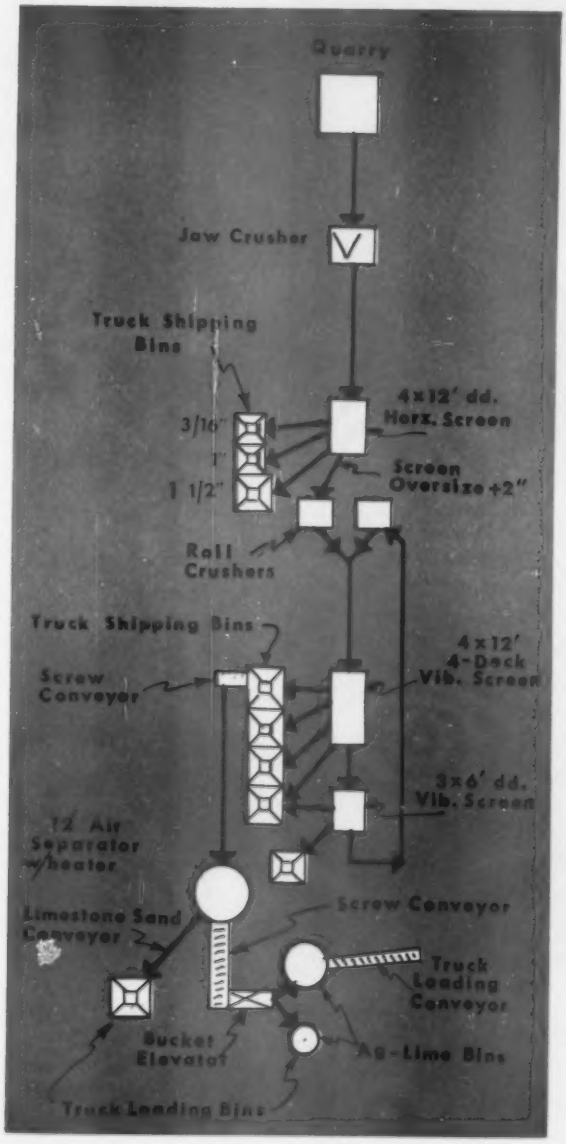
TOE-HOLE DRILLING in the quarry greatly increases the yield of small stone in blasting

AGLIME BINS and their elevator dominate the plant. Quarry-stone is screened at the left, with small sizes put into truck shipping bins. Only newly crushed limestone is taken to the screen tower at the right

THAT WASTE HEAP MAY BE VALUABLE!

continued from page 91

screen to make two products—an oversize to be taken to another hammermill and recycled in the system, and a smaller size ready for shipment. Material through the bottom deck of the small screen joins the 1¼ x ½-in. stone from the second deck of the big screen and drops to a truck shipping bin. Other bins hold the ½ x ¼-in. and ¼ x ⅛-in. sands produced by the two lower decks. Minus ⅛-in. fines are stored in a steel bin that can be used to ship unprocessed aglime by truck.



Here's where the air separator comes in. The aglime bin is fitted with a screw conveyor just above the loading gate which draws off material for the separator. And a small belt conveyor spans the distance from bin to top of separator.

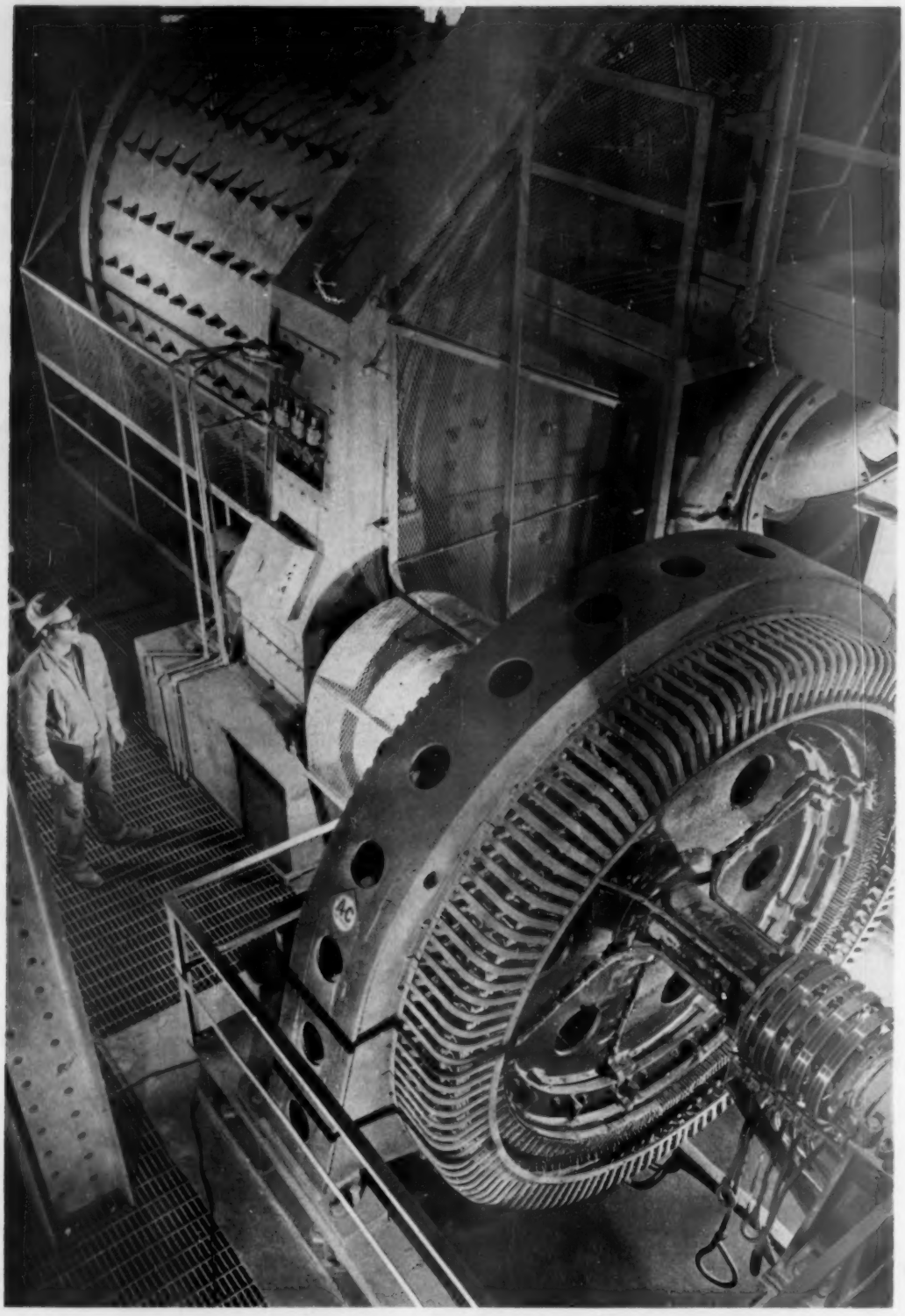
As the fine limestone falls through the feed spout of the separator, it drops to a rotating circular plate. Centrifugal action discharges the material off the edge of the plate into an upward-rising current of hot air. This air stream is strong enough to pick up the relatively light particles and carry them to the top of the unit, there letting them fall down along the outer shell.

Heavier material, falling countercurrent to the flow of hot air, slides down an inner shell of the separator to a discharge spout. Size selection is handled by varying the velocity of the air stream and the rotating speed of the circular feed plate. At Compass Quarry this size-selection feature is used to make several grades of agricultural limestone and to produce limestone sand with more or less 10-mesh fraction.

Separator oversize is conveyed to a square, truck-loading bin for shipment. Fines are taken out in a vented screw conveyor (venting is necessary because the hot fines give off moisture vapor that could condense as they cool in an enclosed storage silo). The 8-in. screw conveyor takes fines to the boot of a 75-ft. bucket elevator feeding one of two steel storage silos. One of the silos, mounted on concrete piers, permits direct truck loading, while the other is fitted for truck loading with a tubular, inclined screw conveyor. **END**

MAJOR EQUIPMENT REFERENCE

Wagon drill, 4½-in.	Joy Mfg. Co.
Compressor	Joy Mfg. Co.
Shovel, 1¼ cu. yd. Lorain	Thew Shovel Co.
Truck, Dumptor	Koehring Co.
Front-end loader 2¼ cu. yd.	Frank G. Hough Co.
Diesel generators (2)	General Motors
Diesel engines (2)	General Motors
Diesel engine	Murphy Diesel Co.
Jaw crusher, 20 x 30-in. primary	Universal Engineering Co.
Vibrating screen, 3 x 6-ft., 2-deck	Universal Engineering Co.
Hammermill crushers (2)	Universal Engineering Co.
Vibrating screen, 4 x 12-ft., 2-deck horiz.	Iowa Mfg. Co.
Shipping scale, 50-ton	The Howe Scale Co.
Air separator, 12-ft. diam.	Sturtevant Mill Co.
Vibrating screen, 4 x 12-ft., 4-deck	Aggregates Equipment Inc.
Belt conveyors	Aggregates Equipment Inc.
Bucket elevator, 75-ft. ctrs.	Aggregates Equipment Inc.
Screw conveyor, 8-in.	Aggregates Equipment Inc.
Steel silos, 11-ft. 5-in. diam. x 20 ft. high	Aggregates Equipment Inc.
19-ft. 1-in. diam. x 50 ft. high	Aggregates Equipment Inc.
10-ft. x 10 ft. sq. x 8 ft. high	Aggregates Equipment Inc.
Plant design & layout, ag-lime system	Aggregates Equipment Inc.
Installation	Aggregates Equipment Inc.



A TYPICAL BIG BALL MILL in the cement industry is this 13 x 16-ft. single-compartment raw mill driven by a 1,500 hp. motor

A "work index" helps to analyze materials and points the way to greater crushing and grinding efficiency

HERE'S A NEW APPROACH TO CRUSHING PROBLEMS

by W. J. Zacher*

YOU DON'T HAVE TO BE SHERLOCK HOLMES to suspect the work of gremlins in a cement plant's grinding circuit. Production bottlenecks expose their work, and excessive costs measure their effectiveness. Tracking down the culprits, however, "is elementary" only if you know how to look for them.

We know the commonest causes of trouble: Ball charge problems (either incorrect ball size or not enough balls in the mill); moisture problems (over .5-percent moisture in dry grinding feed or wrong solids-liquids balance in wet grinding); oversize feed and improper set of the air separator in dry circuits, or just plain materials handling problems.

You will be on the way to discovering which of these or similar problems are hampering the efficiency of your grinding mills if you will do two things: First, determine the proper ball load for the mills; second, apply work index figures to see whether the total work required by them compares with laboratory determinations. The reward, of course, will come in lower production costs via improved operation.

Cement plant grinding mills play a two-fold role. First, they prepare suitable kiln feed. Depending on the kiln characteristics, they must grind cement raw materials to between 78 and 93 percent minus 200 mesh, with a minimum amount of spitzers (plus 48 mesh material). Also, they must grind clinker to approximately 3,300 Blaine for Type 1 portland cement, finer for masonry, air-entrained and other types.

What is the most you can expect from your grinding equipment? The amount of raw material or finish cement any given mill will produce depends on the size of the mill, the feed size of material being ground, the product size desired and the work index of the material itself. (See Table I for common mill sizes in the cement industry.)

Correct ball charge in a grinding mill is important because it is a key to how much horsepower a mill will draw. If a mill is not drawing its rated horsepower, nine times out of ten the reason will be found in low ball charge. Cement grinding mills should have a grinding charge that occupies 40 to 45 percent of mill volume; if the charge is less, horsepower drops off.

To determine how much horsepower a mill develops, install a kilowatt meter at the motor terminals. Such a meter should be in every circuit, but if none is available, your local power company can determine the kw. drawn by a mill motor for you. Multiply motor kw. $\times$ 1.34 $\times$ .92 to get mill hp. The 1.34 factor is to convert watts to horsepower (.746 kw. — 1 hp.). The .92 factor compensates for motor efficiency which, with synchronous motors, is about 92 percent. The resulting figure is actual horsepower drawn by the grinding mill.

To check the ball load, first go into the mill and measure its actual diameter inside the liner plate (not lifters). For instance, for a mill that is 10½ x 17-ft. with 3-in. liner plate, the inside diameter will measure 120 in. Second, measure the vertical distance from the top liner plate (not the lifter bar) of the mill to the charge level in the mill. Take this measurement at each end and at the middle to get the average distance. Next, substitute the inside mill diameter in inches for $\underline{D}$ and the average distance from the top of the mill to the ball charge level for $\underline{Q}$ in the following formula:

$$Vp = 113 - 126\ Q/D$$

Please turn page

*Processing Machinery Dept., Allis-Chalmers Mfg. Co.

HERE'S A NEW APPROACH TO CRUSHING PROBLEMS

continued from page 95

Vp equals the percentage of ball charge in the mill. For example, if in a 10½ x 17-ft. mill with 3-in. liners, D = 120 in. and the charge is 70-in. down from the top of the mill, then:

$$Vp = 113 - 126\ (70\text{ in.} \div 120\text{ in.})$$
$$Vp = 40\text{ percent}$$

From Table I, we can learn that this 10½ x 17-ft. mill, with a 40-percent ball charge, has 152,000 lb. of balls.

If Vp, or percentage of volume charge, is less than 40 percent, determine from Table I what a 40-percent charge is for the mill. Then, set up a proportion—40 percent is to so many pounds as your existing Vp is to x pounds—and solve for x. If, in the above-mentioned mill, Vp turned out to be 30 percent, the proportion would be 40:152,000 = 30 : x

$$x = 114{,}000\text{ lb.}$$

The difference between 152,000 and 114,000 lb., or 38,000 lb. of balls, would have to be added to bring the charge up to the correct operating level of 30 percent.

If just a few balls are lacking, only the largest sizes, 3 or 3½ in., need to be added. However, if the charge is down considerably, add a graded charge, using balls down to 1 in. The exact make-up of this additional charge depends on the condition of the charge in the mill.

Table I—Common mill sizes used in the cement industry

Grinding mill size	Number of compartments (standard)	Mill hp.*	Ball load (lbs.) (40 percent mill vol.)
7′ x 11′	1	255	43,000
7′ x 14′	1	314	54,700
7′ x 21′	2	423	84,000
7′ x 24′	2	482	96,000
7′ x 28′	2	565	112,000
8′ x 10′	1	344	51,500
8′ x 12′	1	413	62,000
8′ x 22′	2	585	115,000
8′ x 25′	2	665	131,000
8′ x 29′	2	770	154,000
8′ x 33′	3	875	174,000
8′ x 37′	3	985	196,000
8′ x 41′	3	1090	216,000
9′ x 11′	1	470	71,500
9′ x 13′	1	555	84,500
9′ x 27′	2	990	175,500
9′ x 30′	2	1100	196,000
9′ x 36′	3	1320	235,500
9′ x 42′	3	1540	272,000
9½′ x 13′	1	605	95,000
9½′ x 15′	1	700	110,000
9½′ x 17′	1	800	125,000
10′ x 15′	1	810	120,000
10′ x 17′	1	920	136,000
10′ x 23′	2	1050	193,000
10′ x 28′	2	1280	235,000
10′ x 34′	3	1550	286,000
10½′ x 15′	1	910	134,000
10½′ x 17′	1	1030	152,000
11′ x 15′	1	1030	142,000
11′ x 16′	1	1100	152,000
11′ x 23′	2	1500	219,000
11′ x 28′	2	1820	267,000
11′ x 32′	2	2100	306,000
11′ x 40′	3	2600	383,000
11½′ x 14′	1	1030	145,000
11½′ x 17′	1	1250	175,000
12′ x 34′	2	2500	399,000
13′ x 16′	1	1500	200,000
13′ x 20′	1	2000	280,000

*The above horsepower ratings are for dry grinding mills. If wet grinding is used the mills will usually draw 10 percent less horsepower, due to the lower friction factor of the slurry in a wet mill.

An explanation of the work index will throw more light on the efficiency of your grinding mills. This is a most valuable tool. It is an accurate measurement of the total work required to produce mill products and can be determined by laboratory test. Our Allis-Chalmers laboratory can make this determination on any 50-lb. sample. For cement raw materials, the average work index is 10.57 when grinding wet and 14.1 when grinding dry. For clinker, it is 17.8 when grinding dry.

Table II gives work indices for one cement company's materials that our laboratory tested. Note that the laboratory report figures are always based on wet grinding, even for clinker. To determine the work index for dry grinding, multiply the figure given on the test report by 4/3.

Knowing the work index for material helps several ways in cement manufacture. First, it lets you compare a specific material with the average of hundreds of raw materials and clinkers tested. Second, it lets you compare materials from specific locations with materials being ground by different plants of your company. For instance, if both raw materials and clinkers have higher work index figures, you know that they will require more power to grind. And, more important, knowing the work index enables you to determine a grinding bottleneck.

Use this method to determine the operating work index of any mill. First of all, establish how many kw. a mill is actually drawing, according to instructions given above. Then, determine short tons per hour of mill product. By running a screen analysis of the feed and product, the 80-percent

Please turn to page 98

30-ton gyratory...

hard-faced with

SEMI-AUTOMATIC WELDER

STOODY SEMI-AUTOMATIC WIRES *are available in a wide range of alloys for application through most standard semi-automatic welding machines.*

This gyratory is used in the reduction of copper ore, a tough operation that results in severe metal loss. In rebuilding the mantle, manganese bars were first welded in place with Stoody Manganese; the entire wearing area was then overlaid with Stoody 100 applied with the semi-automatic welder. 1800 pounds of weld metal were required for the job. The combination of Stoody alloys and the semi-automatic welder measurably increases service life and reduces maintenance costs on equipment subject to destructive wear. Your Stoody dealer (check the Yellow Pages of your phone book) has detailed information and will gladly demonstrate in your own shop.

STOODY COMPANY

11942 East Slauson Avenue • Whittier, California

Enter 1271 on Reader Card

HERE'S A NEW APPROACH TO CRUSHING PROBLEMS

continued from page 96

Table II—Work index figures

	Raw material		Clinker
	Wet	Dry	Dry
Location 1	7.1	9.5	—
Location 2	11.3 (w/o clay)	15.1	19.4
	12.2 (w clay)	16.2	—
Location 3	9.0	12.0	20.6
Location 4	8.6	11.5	15.6
	11.3	15.1	17.3
Location 5	8.1	10.8	21.8
Location 6	9.0	12.0	18.2
Location 7	8.5	11.3	17.3
Location 8	8.1	10.8	

passing point of each can be determined. (This point must be given in microns. There are 25,400 microns in an inch. See Table III for inch, mesh and micron relationship.)

As a rough check of the "microns 80 percent passes" for the feed size, the following chart may prove useful:

FEED SIZE

100 percent minus	80 percent minus
1½ in.	25,000 microns
1 in.	18,000 microns
¾ in.	12,500 microns
½ in.	8,500 microns
⅜ in.	6,000 microns
3 mesh	4,200 microns
4 mesh	3,000 microns
6 mesh	2,100 microns

Very fine grinding loses efficiency for several reasons. These include: oversize grinding balls, size reduction at high power cost below the normal mosaic structure at the "grind limit" and ball coating in dry grinding. The normal laboratory test work index must be increased by multiplication by a factor f to compensate for the loss of grinding efficiency when the 80 percent passing size P is less than 70 microns.

The factor f is found from: $f = (P + 10.3) \div 1.145P$

The tabulation below uses the average relationship between Wagner and Blaine surface areas:

		PRODUCT	
Wagner	Blaine	Wi Factor f	80 percent minus (Microns) (P)
1,400	2,570	1.018	62.4
1,500	2,770	1.040	53.6
1,600	3,000	1.070	45.7
1,700	3,180	1.094	40.7
1,750	3,310	1.111	37.6
1,800	3 370	1.120	36.3
2,000	3,820	1.191	28.2
2,500	4,790	1.374	18.0
3,000	5,850	1.622	12.0

The operating work index for either raw or finish material is found by the following formula:

$$Wi = \frac{W}{10/\sqrt{P} - 10/\sqrt{F}}$$

Wi — work index; W — kwh. per ton of product (2,000 lb.); P — 80-percent passing point in microns of product and F — 80-percent passing point in microns of feed. (The Wi determined is for wet grinding. For dry grinding, multiply by 4/3).

A comparison of the work index arrived at from plant operation with the work index determined in the 50-lb. laboratory tests may indicate a grinding bottleneck and start you toward the solution. On the other hand, your work index figure may be lower than the lab test index. In that case, one of two things is possible: Either the material is easier to grind than the sample tested, or your mills are doing an outstanding job. If the work index figure in your plant and the laboratory are the same, your operation is efficient.

Earlier in this article I mentioned some factors that might contribute to a higher work index. Let's check them off:

Ball charge problems. These can be rectified by seeing that the ball charge corresponds with data in Table I.

Moisture problems. To correct high moisture (over .5 percent) in dry grinding, improve your drying, conveying and storing facilities. Draw more hot air suction through the mill; use grinding aid. For wet grinding, improve the solids-liquids balance by experimenting with the ratio.

Please turn to page 126

Table III—Inch, mesh and micron relationship

Inch opening	Microns Opening	U. S. No.	Mesh size (Tyler)
	50.8 mm.		2 in.
	38.1 mm.		1½ in.
1.050	26.67 mm.		1 in.
.742	18.85 mm.		¾ in.
.525	13.33 mm.		½ in.
.371	9.423 mm.		⅜ in.
.263	6.680 mm.		3 mesh
.185	4760 microns	4	4 mesh
.131	3360 microns	6	6 mesh
.093	2380 microns	8	8 mesh
.065	1680 microns	12	10 mesh
.046	1190 microns	16	14 mesh
.0328	840 microns	20	20 mesh
.0232	590 microns	30	28 mesh
.0164	420 microns	40	35 mesh
.0116	297 microns	50	48 mesh
.0082	210 microns	70	65 mesh
.0058	149 microns	100	100 mesh
.0041	105 microns	140	150 mesh
.0029	74 microns	200	200 mesh
.0017	44 microns	325	325 mesh

New Conveyor System

. . . gives far greater belt life

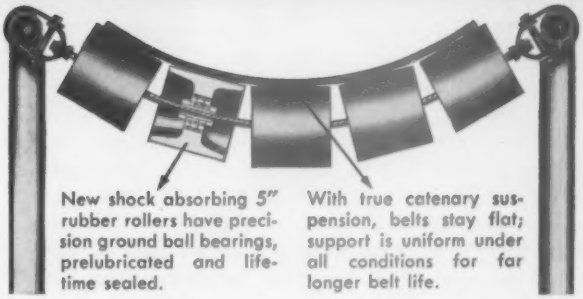
. . . reduces maintenance

. . . and you get it *exclusively* from McNally Pittsburg

A completely new Cradle Idler* is the key to this high-efficiency McNally Pittsburg conveyor design. By mounting new 5" rubber rollers on a *nonrotating*, stainless steel rope, dangerous harmonics and "loping" are eliminated—permitting greater capacity and faster belt travel with minimum spillage. The *true catenary* of this suspension provides uniform belt support with no bends or creases—belt life is substantially increased.

Because of the unusual simplicity of this new McNally Pittsburg conveyor design, installation costs are lower—and maintenance costs are at a minimum.

* Patents Pending



New shock absorbing 5" rubber rollers have precision ground ball bearings, prelubricated and lifetime sealed.

With true catenary suspension, belts stay flat; support is uniform under all conditions for far longer belt life.

On-the-job construction is simple. The entire conveyor uses standardized components for easy assembly to fit your particular needs.

WRITE TODAY | for details on this new McNally Pittsburg conveyor which costs less to install . . . saves money every day it is in use.

McNALLY PITTSBURG

McNally Pittsburg Manufacturing Corporation—
Manufacturing Plants: Pittsburg, Kansas • Wellston, Ohio
Engineering and Sales Offices: Chicago • Rio de Janeiro
Pittsburg, Kansas • Wellston, Ohio

McNally Pittsburg Mfg. Corp.
Dept. RP
Pittsburg, Kansas

☐ Please send information on the new McNally Pittsburg belt conveyor.

☐ Have Sales Engineer call for further consultation.

Name_____ Title_____

Company_____

City_____ State_____

NSGA board votes new, needed services

The accent is on fiscal matters, public relations, insurance and pension programs

THE NATIONAL SAND AND GRAVEL ASSOCIATION is shooting for more and better service to members. And they're hitting the mark. New service programs were voted by the board because there's a growing need for help throughout the industry. Rising demand for products, new labor laws, stiffer competition—these and many other factors have supplied impetus for expanded services.

If you're a member of NSGA, look for a new ring-binder file on fiscal matters. You'll receive it soon. More and more usable material will be sent your way, including studies on many phases of public relations. The association's insurance and pension plans are highly valuable, as you know. But they're getting better. Now, you can get a new plan—long-term disability coverage for executives and key personnel. The plans are so good, in fact, that other associations have asked for, and have received, the right to participate in the program.

The board of directors of NSGA met at Lake Placid, N.Y., September 27-30 to start the wheels turning on the new, expanded services. The meeting was chairmanned by E. Phil Gemmer, president. A joint meeting was held with the board of directors of National Ready Mixed Concrete Association on September 30.

Association headquarters will be moved this month. The new address in Washington, D.C., will be 1411 K Street, N.W. Executive Secretary V. P. Ahearn said the new offices will provide more space to carry on staff work more effectively. The new location also is near Washington's newer hotels.

There's much more interest in fiscal matters, particularly costs. A recent meeting of industry controllers in Toronto, sponsored by the joint committee on fiscal policies, pointed up the growing need for improved cost keeping and analysis. Henry Kerwin, chairman, proposed the adoption of four recommendations in line with his committee's work. They are: (1) that the next controllers' conference be held in Chicago, Ill., during November 1960; (2) that the associations sponsor a loose-leaf binder to contain present and future publications on fiscal matters as they become available; (3) that approval be given a cost-ratio questionnaire to NSGA members and that arrangements be made for sending it out, and (4) that results of the questionnaire on cost ratios be sent to members of both associations via executive letter. All recommendations were approved by the board of NSGA, and later by the joint boards.

Several excellent talks on various phases of work covered by the committee were given at the July controllers' conference. A tip to members: Since copies have been made available to each of you, it was suggested that you take time to read them for your personal and company gain.

Tempo of work on public relations is accelerating. Already the association publishes a loose-leaf binder which includes many valuable articles on the subject. Consensus is that this is a most helpful manual, and that most of you are using it to advantage. The purpose of the manual is to im-

Please turn to page 102

HEADING UP THE DELIBERATIONS at the Lake Placid meeting of NSGA's board of directors were (from left to right) E. Phil Gemmer, president; E. K. Davison, vice president, and Fred Curtis, secretary-treasurer

VERSATILE SIMPLE AUTOMATIC

DRY SOLIDS CONVEYING

Cement	Petroleum Coke	Dolomite
Carbon Black	Pulverized Coal	Pharmaceuticals
Fertilizers	Fly Ash	Sand
Hydrated Lime	Fullers Earth	Fire Clay
Lump Lime	Soda Ash	Flour

Powdered and Granular Dry Chemicals

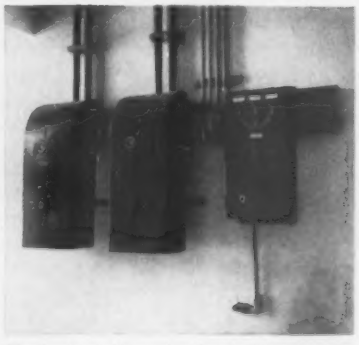
THE KENNEDY PNEUMATIC CONVEYING SYSTEM HANDLES THESE AND MANY OTHER PRODUCTS WITH *EASE* AND *ECONOMY*

Dry cement arrives at the plant by truck in KENNEDY Air Activated Containers. It is transferred directly by air pressure to this storage silo at 10 tons per hour through a 2½" pipe.

Eternit Colombiana S. A. looked for simplicity plus completely automatic operation for the dry cement handling system of their new asbestos-cement pipe and sheet plant at Bogota, Colombia.

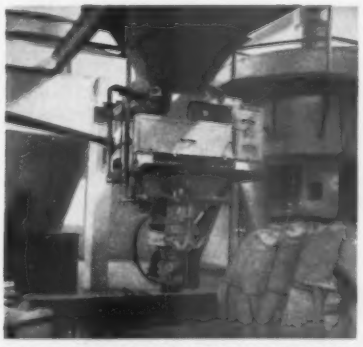
The KENNEDY Pneumatic Conveying System met—*and exceeded*—every exacting requirement.

A KENNEDY Pneumatic Pump is located immediately below the main silo. Batch transfer to intermediate bins is accomplished without screws or other rotating parts. Batch sequence is entirely automatic.



A low level control transmits a signal to this center as the level drops in any of three intermediate bins. All controls for the complete system are in the small right hand box; the two starters are for air compressors.

When actuated by the control center, this 3-way distribution valve opens the 2½" pipeline to the proper bin; the Pneumatic Pump then transfers a 1,000 pound batch of cement from the main silo.



Below each of the intermediate bins is a mixing station which correctly proportions the ingredients for the exact product composition desired. From delivery to finished mix—every operation is simply, automatically controlled.

This simplicity, versatility and dependability is characteristic of the KENNEDY Pneumatic Conveying System. Low maintenance is assured because there are no motors, screws or other major wearing parts exposed to the moving material.

Investigate this proven system for your materials handling problems.

KENNEDY VAN SAUN

MANUFACTURING & ENGINEERING CORPORATION

405 PARK AVENUE, NEW YORK 22, N.Y. • FACTORY: DANVILLE, PA.

PRIMARY & SECONDARY GYRATORY CRUSHERS • JAW CRUSHERS • ROLL CRUSHERS • IMPACT BREAKERS • HAMMER MILLS • ROD AND BALL MILLS • KILNS • DRYERS • SCREENS • MECHANICAL & PNEUMATIC CONVEYORS • COMPLETE CRUSHING, LIME, CEMENT & CARBON PASTE PLANTS • KENNEDY RESEARCH AND TESTING SERVICE

Enter 1273 on Reader Card

NSGA BOARD VOTES NEW, NEEDED SERVICES

continued from page 100

prove public opinion or tolerance of your company. Published material, sent out from headquarters as it becomes available, will broaden this information. And more is to come.

E. K. Davison, reporting for his committee on public relations, told of plans to release additional data on rehabilitation this fall. There will be an accent on safety material in the future. Much of this information will come from a subcommittee on safety.

Another new field of work that may be handled by the public relations committee: Discussion unfolded a feeling that the industry is involved in national and state programs for abatement of stream pollution. The committee has done valuable work in the past, and projects now in the working stage indicate that there will be no letup of its good work.

Taxation continues to be a vital problem of the industry. Report of the committee on taxation was made by Robert Mitchell. He takes over the committee leadership from J. Rutledge Hill, recently deceased. Mr. Hill was properly credited as being for a long time the "lone voice" on percentage depletion in the industry. Mr. Mitchell honored Mr. Hill's excellent work for the association, stating, "We who now enjoy percentage depletion enjoy it as a direct result of Perch Hill's courage and perseverance."

The Congressional Ways and Means Committee deferred action on the Treasury Department's percentage depletion bill until the next session of Congress. NSGA did submit a statement on this bill during the March 1959 committee hearings. It recommended that (1) the "commercially marketable" standard be retained in the statute; (2) pulverization be specified as an includable process, and (3) an allowable process not be excluded from "mining" merely because it follows an unallowable process.

General hearings on tax revision were scheduled by the Ways and Means Committee for last month.

Cleaning and repairing railroad cars, which costs sand and gravel producers lots of money, has been a problem for a long time. The board approved a recommendation to set the dimensions of the problem before Ralph E. Clark, chairman of the Car Service Div., Assoc. of American Railroads.

Answering a questionnaire on the railroad car problem, some NSGA members disclosed that certain carriers understand and have tried to do something about it. Other carriers merely told producers to reject a car if they don't like it. Of course, rejection can cause serious car-supply problems under certain conditions. The report on this survey was made by Charles E. Brady of Salisbury, N.C.

There is a new chairman of NSGA's Manufacturers' Division. William Rundquist, who has changed company affiliations, resigned the post. The work of chairman has been taken over by Emil Deister, former vice chairman.

Response to the Group Insurance Plan already has shown it to be one of the most outstanding services available through NSGA. A progress report on the plan, jointly sponsored by NSGA and NRMCA, started off the joint meeting of the boards of directors.

Number of companies now using the plan has grown 11 percent in the last year. Fifteen new members have joined NSGA because of insurance plan benefits. Thirty more firms, from Arizona, are expected to become members, primarily through the help of James A. Murphy of Phoenix.

A new long-term disability income plan for officers and employes of member companies was described by Donald Shepherd. This plan is limited to executives and key personnel. Mr. Shepherd also reported the progress of the retirement plan, stating that interest continues to run high. As many as 200 companies have expressed interest in it; programs have been worked out for 80, and 30 plans are now in force. They cover $6 million in death benefits.

The joint boards approved three proposals: (1) adoption of the long-term disability income plan; (2) inclusion of the National Concrete Masonry Association in the retirement plan, and (3) formation of one policy body to oversee all benefit plans of the joint associations—group insurance, retirement and disability benefit plans.

Three projects are underway on mobile radio: The joint committee for mobile radio is (1) publishing a radio operators' manual and guide; (2) encouraging members to participate in frequency allocation work of the Special Radio Services Association, and (3) attempting to get additional frequencies for SIRCA. The manual's outline has been prepared, and the committee expects to have the manual ready for distribution by February 1960. Your help is being asked for SIRCA, because without that support it may have very little chance of survival.

Please turn to page 128

Lima 1250 3½-yd. Shovel nears end of million-and-a-quarter-yd. excavating job on highway reconstruction project near Knapp, Wis.

"LIMA 1250 moves half million yards of rock—at 270-300 yards hourly!"

says Lawrence Gerke, Wisconsin contractor

The job was tough, the schedule tight. "In only 2 miles," says contractor Lawrence Gerke, of Merrill, Wis., "we had to excavate a million and a quarter yd. . . . almost half of it rock!"

High performance, low maintenance

The project involved reconstruction on U. S. Interstate 94 near Knapp, Wis. Gerke needed a high performance machine with low maintenance requirements. He says, ". . . After considerable analysis of equipment, we purchased a Lima Type 1250 for rock excavating. In many cases no blasting was done. Yet, working in this material, the Lima constantly averaged 270 to 300 yd. per hour. When shovel work was completed, the 1250 was easily converted in the field to a dragline."

The crawler-mounted Type 1250 has turned in outstanding performances everywhere as a 3½-yd. shovel, 85-ton crane, and variable dragline.

Air-controlled precision

Main operating and auxiliary functions are air-controlled for smooth, precision performance at full capacity operation. Choice of diesel engine or electric motor with torque converter.

Other features and available equipment include: Independent propel, extra-high-speed hoist attachment, third drum, power reversing hoist drum, two types of rigid and folding gantries. The 1250 can be knocked down to units of less than 60,000 lb. for haulage.

Whatever your job, there's a Lima type and size exactly right—½ to 6-cu. yd. shovels, cranes to 110 tons, draglines variable. Learn now why so many contractors agree with Lawrence Gerke when he says, "We are completely satisfied with the operation of our Lima." See your nearby Lima distributor or write to us.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA Construction Equipment Division, Lima, Ohio

BALDWIN · LIMA · HAMILTON

5932

Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment

BALDWIN BLH LIMA-HAMILTON

Your new plant or expansion idea

Raw materials available?

Market available?

Location correct?

Capacity adequate?

Readily financed?

Right time to build?

Kaiser Engineers specializes in the design and construction of major facilities used throughout the Minerals industry, and has world-wide experience in design of such facilities.

Among KE's most valued services are sound, searching, economic analyses, feasibility studies and site and market evaluations. In a word—*Pre-Engineering*—impartial, outside analysis which helps you decide whether to proceed with, defer or modify the project.

Kaiser Engineers offers you cost-saving, time-saving one-company service from concept through start-up.

KAISER ENGINEERS

Division of Henry J. Kaiser Company
Oakland 12, California
Pittsburgh, Washington, D. C., Chicago, New York

• KE projects include work in Australia, Brazil, Ghana, India, New Zealand, as well as Canada and the United States. Assignments include iron ore concentrating plants, cement plants, bauxite and alumina processing plants and diatomaceous earth facilities.

5459-M

Enter 1270 on Reader Card

How good housekeeping can save you money

by Leo Bunds*

HOW IMPORTANT IS HOUSEKEEPING? I'll put it this way: It's the foundation of the entire Pacific Cement and Aggregates, Inc., operation in my district, the San Francisco Bay area. We have set up a general policy under which we try to keep our plants at Eliot and Centerville, Calif., clean and in order at all times. We've found that orderly plants run smoother and cheaper.

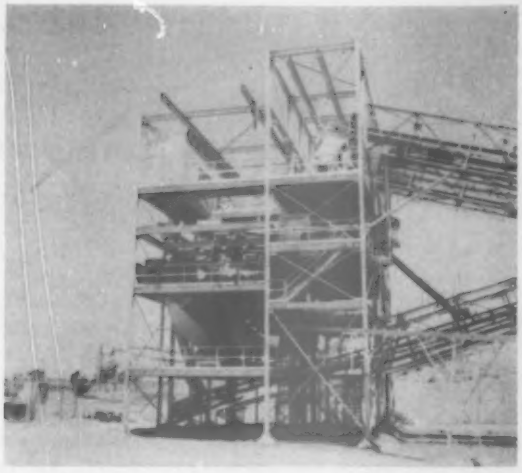
For one thing, when a plant is kept clean, its operation costs go down. Do a little painting whenever it is needed, before rust appears. A plant will last a whole lot longer than if you let painting go for a year, then try to catch up when it's too late and rust has set in.

Painting is preventive maintenance. Painting and other cleaning methods uncover needed repairs before it's too late and operations have to be shut down.

Cleanliness affects personnel. A sloppy-looking plant can cause sloppy work, while a sharp-looking plant can bring about sharp work. Keeping a plant clean also reduces fire and safety hazards which, in turn, lowers insurance rates.

How do we keep a plant clean? First, we let the men responsible know that the plant is supposed to be kept clean. We have them keep at it until the rest of the employes become cleanliness-minded. For example, an oiler will take a rag and wipe off

Please turn to page 122



PAINTING these screens and conveyors is part of the preventive maintenance program

EVEN THE STOREROOM at the Eliot plant is immaculate

MORE THAN 150 trucks are loaded from these bunkers daily, yet the area is kept spotless

*District Operations Manager, Pacific Cement & Aggregates, Inc.

Changing techniques in mining, processing and materials handling will bring higher efficiency and some new problems

Lime industry looks at new developments

THE LIME INDUSTRY IS ON THE MOVE. Technically, it is changing to conform with new mining and processing developments that promise more efficiency in operation. But the change-over will bring some new problems, too.

New methods and the new problems were aired at the meeting of the Operating Division, National Lime Association, held in Philadelphia, Pa., October 1-3.

More raw materials for lime manufacture may come in the future from underground mines than from quarries. Location of future reserves and improved techniques in mining underground affect this possibility. Contrariwise, availability of new drilling techniques and portable crushing equipment for quarry operation promises to raise efficiency in quarries. Any way you look at it, the lime industry is going to benefit.

Plant operation shares in the move toward progress, too. New kilns are being highly instrumented to get greater efficiency and better product control. Processes for hydrating and milling dolomitic and high-calcium limes are being improved to get better plasticity in products. And packaging and materials-handling processes are being perfected through the use of centralized controls.

What's ahead in mining operation? Dr. Robert H. Merrill, physicist for the Federal Bureau of Mines at College Park, Md., says that more and more raw materials will come from underground mines. He didn't specify why, but it is assumed that most reserves for good lime products may lie in areas that require such mining. If so, this presents a real problem in learning more about underground mining techniques, particularly for operators now well versed in quarry mining.

How big can underground rooms be made? How much will it cost? Most of all, answers depend upon knowledge of stresses in deposits. Limestone deposits may be of two kinds: thinly bedded or massive. Dr. Merrill's discussion of stress engineering was limited to the thinly bedded type.

Only during the past two decades have stress studies been made available. Now we know, said Dr. Merrill, that the roof divides; rock layer as an immediate roof separates from the main roof. Separation becomes larger as room width increases. So, he developed some formulas to determine best room width, designed around tension of rock.

Support of roof by pillars is another important factor. Dr. Merrill warned that you should know the roof span before solving for the pillar area. Then he developed formulas for pillar size and spacing. Space doesn't permit presentation of the formulas here, but they may be obtained from Dr. Merrill in College Park, Md.

Once openings are mined according to design, how long will they remain stable? The practical answer is to mine an experimental room and check it yourself. Generally, a roof sags and increases in stress with age. But it should last longer than six months, which is the time normally required to take out the stone.

The longhole method of drilling and blasting has brought efficiencies to the Bellefonte mine of the Warner Co. Pat Coore, superintendent of the mine, said that the method is being used on development and production work. It has improved the ratio of tons mined per pound of powder used.

National Gypsum Co. uses the method also, at its Bellefonte, Pa., mine—with good results. Diamond drills are used. The average footage obtained per bit is nearly 6,000, John Pinto reported.

The biggest problem in using the method is

Please turn to page 108

Industry's top technical team at your service

ALLIS-CHALMERS builds a complete line of processing machinery for the nonmetallic minerals industry. Allis-Chalmers also produces electrical generation, distribution and utilization equipment. Out of this unequalled diversity has come the unique ability to integrate equipment for a complete process — yes, even for an entire plant.

Each Allis-Chalmers product department has its own specialists. Ideas and technical information received from many departments are correlated in *one* department specializing in *nonmetallic minerals industry application*. Components are matched to your requirements. New equipment is integrated with existing equipment into a productive, profitable operation.

Get all the facts. See your Allis-Chalmers representative or write Allis-Chalmers, Milwaukee 1, Wisconsin. In Canada, write Canadian Allis-Chalmers Ltd., Box 37, Montreal, Quebec.

At Allis-Chalmers, integrated thinking precedes the application of your integrated equipment

Laboratory testing takes guesswork out of planning

In the Allis-Chalmers processing laboratories, samples can be put through crushing, grinding, screening and other tests to predetermine the right equipment and process for any given circumstance.

"Work Index" method prevents misapplication

The "work index" formula used by Allis-Chalmers offers the only scientific method of determining equipment size and horsepower requirements.

Continuous field service keeps operation running smoothly

Your A-C representative makes a periodic checkup of equipment performance . . . passes on maintenance tips . . . arranges for additional testing. Orders for replacement parts are given emergency treatment.

A-C ALLIS-CHALMERS

A-5988-CM

LIME INDUSTRY LOOKS AT NEW DEVELOPMENTS

continued from page 106

VICTOR J. AZBE TRUST FUND ESTABLISHED

Significant contributions to the U. S. and foreign lime industries by Victor J. Azbe continue unabated. Having given a major portion of his life toward his self-set goal of perfection in lime burning, Mr. Azbe now wishes to make certain that the work continues indefinitely. Arrangements have been completed with the National Lime Association for setting up a special trust fund through which a prize will be awarded each year for the best technical paper on lime. Mr. Azbe has, we are sure, the unlimited gratitude of the industry for his complete dedication to lime in the past. That future contributions to lime will be made is now assured through his generosity in providing the incentive for continued progress through the Fund.

shooting. The Warner Co. uses 1¼ x 24-in. sticks of 60-percent gelatin dynamite. Holes are not stemmed. Use of millisecond-delay blasting caps has reduced vibration from blasts. This is important since the mine is near a residential area.

A room-and-pillar system is used at the underground mine of Batesville White Lime Co. in Arkansas. As described by William Cobb, drilling is done with a jumbo drill and holes are loaded from a platform.

More research is needed to increase efficiency of quarry blasting, according to Dr. B. J. Kochanowsky, professor of mining engineering at Penn State University. He believes he has one answer to more efficiency in a method of inclined drilling. He developed the method along the line of tilting a vertical face on an angle. This, he believes, requires less effort to blast.

Advantages of the system are many. It gives better fragmentation, eliminates the "toe" problem and reduces secondary blasting. Among many additional advantages is the important one of less cost. Experimentation with the inclined drilling method has resulted in the blasting of 17.5 tons per pound of powder used.

The method has been used with success in Europe, and Dr. Kochanowsky believes it may be used to advantage here.

A portable crawler-mounted crusher was suggested by Dr. Kochanowsky to increase productivity in quarries. The idea is not new, but its application has been small. Advantages claimed for its use include: (1) low power requirement for haulage, (2) high output per man and (3) greater shovel efficiency.

Kiln operation is efficient in Germany. It has to be, since fuel is so expensive there. Robert S. Boynton, general manager of NLA, brought out this fact in an illustrated discussion of European lime manufacture. He visited the continent last summer and photographed many types of lime installations there.

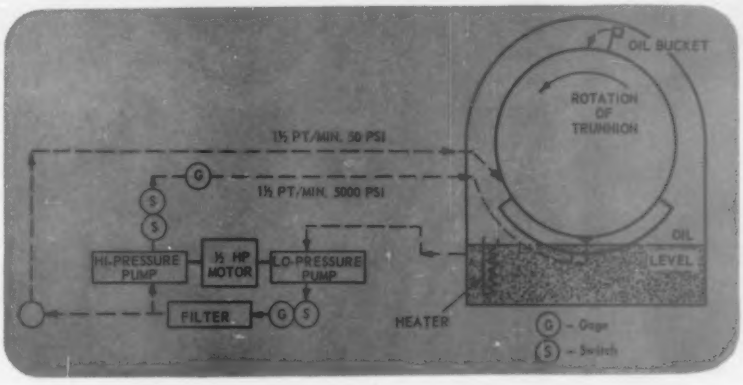
Latest kiln installations in Europe are large, most efficient and highly instrumented. It is claimed that some operations get a thermal efficiency as high as 85 percent.

Some of the stone plants there, with capacities as high as 1,000 tph., are ultramodern in design and operation. The operators constantly strive to get maximum efficiency. Cost of modern plants, that have the maximum in labor saving devices and systems, is high. But they pay off.

New kiln installations in this country are good, too. Kennedy Ellsworth, U. S. Lime Products Div., Flintkote Co., described the Kennedy-Van Saun kilns installed at his company's Las Vegas, Nev., plant. (See ROCK PRODUCTS November 1958, p. 90.) Those kilns were chosen primarily to provide good quality products in line with the company's system of quality control.

The three principal elements of the system—preheater, kiln and cooler—were described and discussed by Mr. Ellsworth. The system is well instrumented, and efficiency is good. Fuel consumption is less than 6 million Btu. per ton, and core is less than 1 percent. Capacity of the plant is 250 tons per day.

How important is return on investment? Do you know what the ratio is for your company? If you don't, R. C. Goerbing suggests you had better find out. As controller supervisor for National Gypsum Co., he ought to know. Mr. Goerbing stressed that measuring the operating results of your business is one of your biggest and most important factors to success today. *Please turn to page 128*



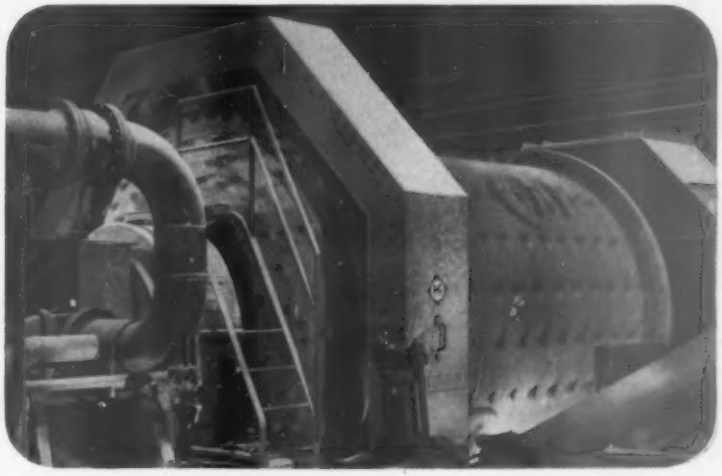
Floating start, ride and stop for big mills

New Lubritrol system provides constant lubrication for trunnion bearings

The new, bigger Allis-Chalmers mills now grinding out profits in progressive rock products plants actually *float on oil.* No bearing-wearing starts. Horsepower waste is kept at minimum. No dry sliding after shutdown. All functions of the *Lubritrol* system are automatic . . . controlled by foolproof pressure gages and switches. Filter removes contaminants.

When you modernize your rock products operation with a bigger mill, insist on Allis-Chalmers — the only mill that gives you the positive protection . . . the operating and maintenance economy of *Lubritrol* constant lubrication.

For complete information, see your A-C representative or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin. In Canada, write Canadian Allis-Chalmers Ltd., Box 37, Montreal, Quebec.



Lubritrol is an Allis-Chalmers trademark.

ALLIS-CHALMERS

A-5934-CM

Enter 1221 on Reader Card

JOB APPEAL UPS EMPLOYE OUTPUT

by Ernest W. Fair

ANY EXECUTIVE CAN EXPECT LOYALTY and hard work from the members of his staff if each individual genuinely likes his job. No one can disagree with that statement. As a consequence, employers have been devising schemes to make jobs more appealing to their employes. Too often, however, the result is a group of pampered individuals who produce less than before the employer endeavored to please them.

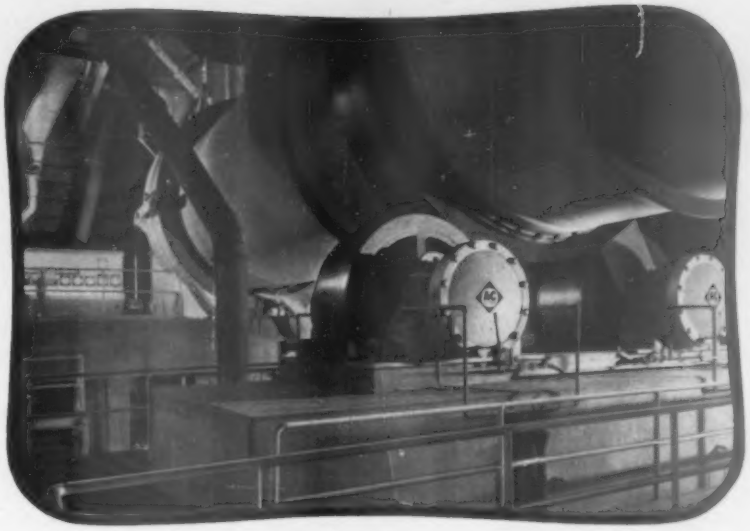
What can employers do to help their employes find pleasure and fulfillment in their jobs? Various approaches that have been proven in actual job situations are found in the following paragraphs of this article. They steer clear of pampering.

A recent survey was made among a large group of workers in various lines of business. It gives the following as reasons why individuals enjoyed and were loyal to their particular jobs.

19 percent—the job was interesting
17 percent—the people with whom they worked
12 percent—contact with people
12 percent—general working conditions
9 percent—the wages
7 percent—the job fit well into their personal life interests
6 percent—easy work
5 percent—the company was fair
5 percent—job security
3 percent—the boss
2 percent—possibilities for advancement
2 percent—autonomy
1 percent—union protection

Note that many of the supposed "fringe bene-

Please turn to page 112



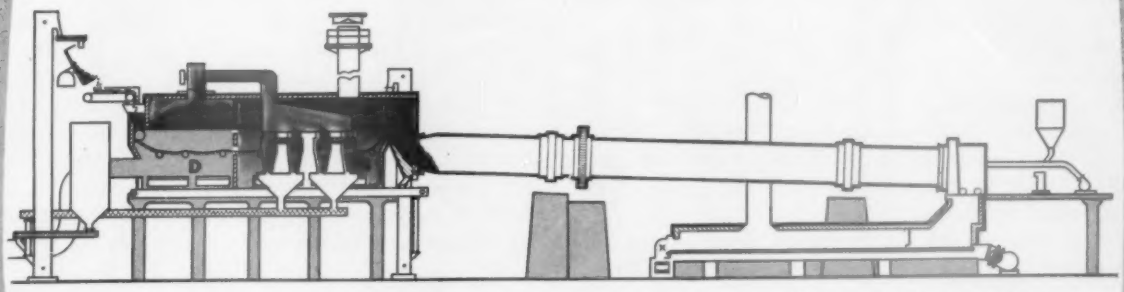
ACL pellet process cleans up cement making

Pelletizing of raw materials makes possible the dust-free operation of the *ACL* "double-pass" traveling grate system.

Along with clean production, making cement with pellets affords a barrel of bonus benefits — product reclamation, maximum burning efficiency, power savings, small space requirements.

How *ACL* "Double-Pass" System Works — In first pass (A to B) 1800° gas from kiln partially calcines feed in section nearest kiln. Gas temperature is reduced to 500°. Cyclones reclaim air-borne dust. In second pass (C to D) green pellets are dried and heated to about 500°. Gas stripped of heat and dust is exhausted in a mere wisp.

For the complete story, see your A-C man or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin. In Canada, write Canadian Allis-Chalmers, Ltd., Box 37, Montreal, Quebec.



ACL is an Allis-Chalmers trademark.

ALLIS-CHALMERS

A-5930-CM

Enter 1222 on Reader Card

JOB APPEAL UPS EMPLOYE OUTPUT

continued from page 110

■ *Survey after survey among employes has shown that, as long as wages are on a par with those being paid by the industry in the particular area, wages are of less importance than other factors . . .*

fits"—job security, advancement and the union—were not of top importance to the worker. Two big factors accounted for 36 percent of the replies: their jobs were interesting and they liked the people for whom they worked.

Here is a short list of how a number of successful managers go about accomplishing this aim. Many of these suggestions can be installed without major cost and, when there is expense, it usually becomes a wise investment.

1—They do everything possible in all levels of contact with the employe, at hiring and throughout employment, to point up the good factors in that type of work.

2—They provide good working surroundings.

3—They make sure all physical facilities make the work as easy or easier than it is in any competitor's firms.

4—They make no plan or arbitrary rules covering the job without talking them over with the employes first, making certain the rules are sensibly framed to be acceptable and desirable to the employe.

5—They exercise care and discretion in hiring anyone in the business so that the people with whom each individual works are of the highest possible caliber.

6—They insist on high standards of individual performance throughout the business to encourage employe pride in the job as well as to produce a maximum amount of salable products.

7—They maintain a policy of fairness in handling every problem with which the employe is concerned no matter whom it involves.

Too often wages are viewed as being of utmost importance. Survey after survey among employes has shown that, as long as wages are on a par with those being paid by the industry in that particular area, wages are of less importance than other factors. Another point of interest is that the more skilled the job, the less important are the wages.

Employers must remember that in planning an effort directed toward getting employes to like their jobs, motivations change as the employe grows physically, mentally and emotionally. Each must be viewed as a separate individual rather than as a member of the group because individuals differ in their job motivations.

It is also wise to keep in mind that an employe's personal situation will affect his viewpoint toward the job. This too must be taken into consideration in planning efforts to help him enjoy his work.

There are also definite assurances that every executive can give the people on his staff with regard to their employment which will make their jobs much more appealing. The more important of these are:

(a) Steady employment and no discharge without cause.

(b) When merited, special concessions are determined by seniority.

(c) Providing the proper equipment with which the employe can work.

(d) Good working conditions: lighting, heating, ventilation, sanitation and safety.

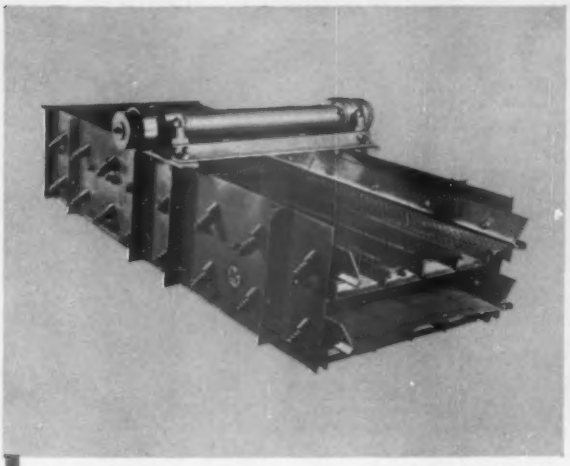
(e) Treatment as an individual with respect for personal integrity.

A policy of steady employment and fair adjustment of grievances has been shown to be of importance to workers in every business and every class of employment. They should be definite parts of any manager's employment rules and he should make certain that every employe is well aware of them.

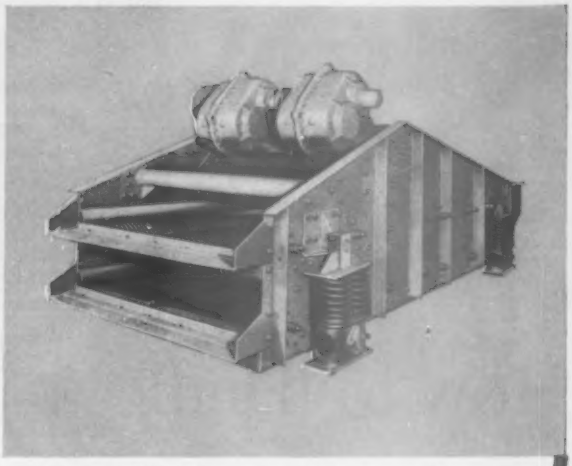
Working conditions must also be considered. In too many instances the management will set up excellent working conditions originally and then neglect them as time goes by. Usually it is a matter of oversight rather than neglect.

Invariably, where a very high degree of satisfaction with their jobs is voiced by employes, working conditions receive constant scrutiny by the business management. They are given equal attention with efforts to make the business attractive to customers. Unfortunately, even the slightest instance can acquire undue importance in the mind of the average employe. What may seem unimportant to management will often be of the utmost importance to the employe.

It is, therefore, advisable that constant checks are made on such conditions through a regular system of inspection and friendly discussion with each employe. Our own actions on the job, or those of anyone in supervision, should also be checked from time to time, for these can get out of balance and create unhealthy situations before we realize what has happened. END



For moderate to fine sizing — wet or dry. **AVS** *Aero-Vibe* inclined screen: Available with wire cloth or perforated plate surfaces. Maximum aperture — 1½ inches. 1, 2 or 3 decks. Sizes 3 by 6 to 5 by 10 feet.



For coarse to fine sizing — wet or dry, rinsing, or media recovery. *Low-Head* horizontal screen: Saves headroom. Wire cloth or perforated plate. Apertures to 2½ inches. 1, 2 or 3 decks. Sizes 3 by 6 to 8 by 20 feet.

FROM ALLIS-CHALMERS COMPLETE LINE

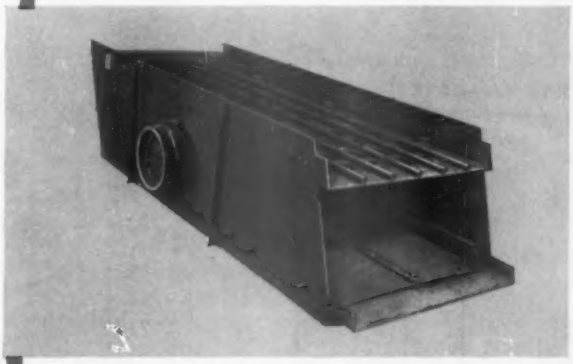
The right screen for your aggregate plant

FOR SCALPING, SIZING, RINSING, WASHING AND HEAVY MEDIA RECOVERY, ALLIS-CHALMERS PROVIDES THE SCREEN YOU NEED

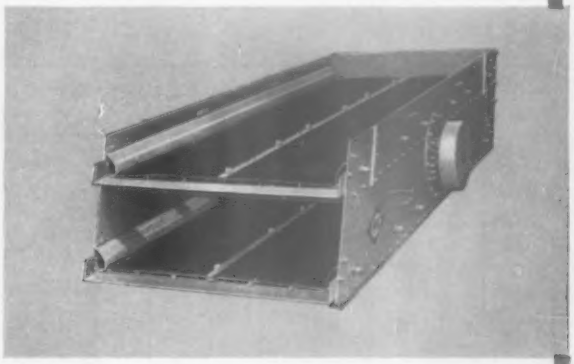
Large or small capacity — wet or dry crushed stone, sand or gravel — whatever your application there's an A-C screen for the job. Building the industry's most complete line of horizontal and inclined screens, Allis-Chalmers gives unbiased recommendations — suggesting to you the screen that will do your job at the lowest possible cost consistent with quality construction.

Built for a beating: There's no skimping on quality at A-C. For example, the frames of Allis-Chalmers screens are carefully machined and *stress relieved* for years of tough usage. Extra-large bearings give added life.

Easy to choose: A helpful screen selection guide has been prepared to help you pick the right model screen for your process. *Contact your Allis-Chalmers representative or write for Bulletin 25B6280. Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin. In Canada write Canadian Allis-Chalmers Ltd., Box 37, Montreal, Quebec.*



For scalping and coarse sizing — wet or dry. **XH** *Ripl-Flo* inclined screen: Wire cloth, perforated plate, rod or stepped grizzly-bar surfaces. Apertures to 10 inches. 1, 2 or 3 decks. Sizes 4 by 8 to 8 by 14 feet.



For light scalping, coarse to fine sizing — wet or dry, and for rinsing. **SH** *Ripl-Flo* inclined screen: Wire cloth or perforated plate. Apertures to 5 inches. 1, 2 or 3 decks. Sizes 3 by 6 to 8 by 20 feet.

Aero-Vibe, Low-Head and Ripl-Flo are Allis-Chalmers trademarks.

ALLIS-CHALMERS A-C

A-1200-CM

Enter 1223 on Reader Card

What special handling procedures should be followed with A-N? What are the major quarry hazards? Speakers answered these questions at the 1959 National Safety Congress

How to handle A-N explosives safely

ADVICE ON HOW TO HANDLE ammonium nitrate explosives safely, and an analysis of types of quarry injuries highlighted talks of rock industry safety specialists at the 1959 National Safety Congress.

Held in Chicago in October, the big National Safety Council-sponsored gathering drew 12,000 persons to hear talks on safety in industry, school, home and farm. Of that number, nearly 200 attended sessions of the Cement, Quarry and Mineral Aggregates Section.

A gold mine of valuable facts on the safe use of the ammonium nitrates (AN) was uncovered by Robert Van Dolah, chief of the Division of Explosives Technology, U. S. Bureau of Mines. He indicated that an information circular will be forthcoming from the bureau to summarize these facts.

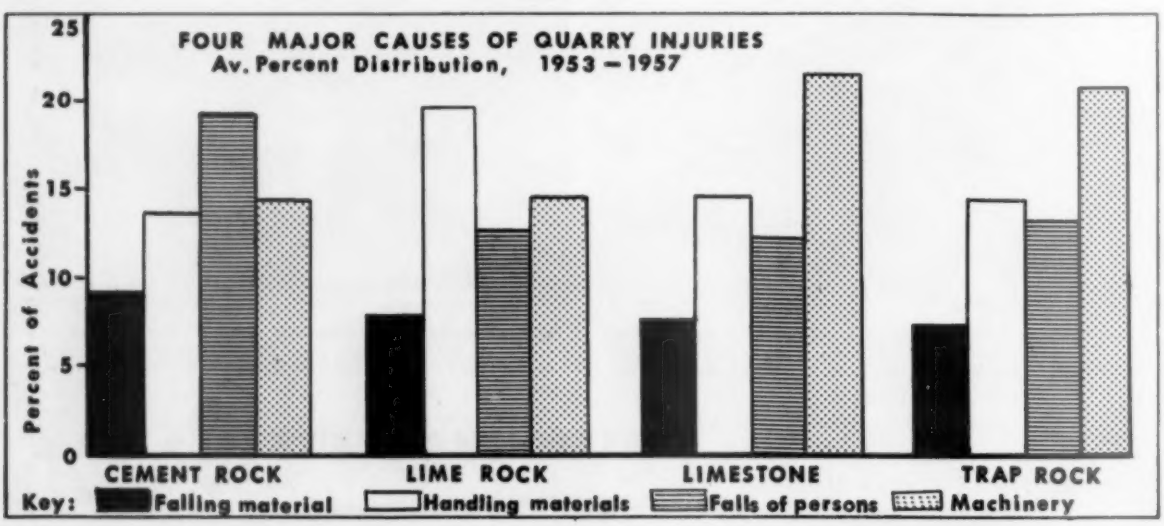
Use of AN explosives is growing quickly as producers jump to take advantage of their low cost and wide availability. He estimated that about 40 percent of the explosives used for industrial blasting in the last few years have been compounded at the site—in other words, AN.

Actually, AN is safer than dynamite, Mr. Van Dolah asserted, since generally it is less cap-sensitive. For instance, it won't explode when a bullet is shot into a bag of the material, as will dynamite. It also has less sensitivity to air blast, mechanical stimulation and sympathetic detonation than previously favored explosives.

But this very safety can lull a blasting crew into dangerous habits. It's not "just fertilizer" when mixed with No. 2 fuel oil. To bring home this potential danger, Mr. Van Dolah reminded his listeners that four of the last 10 really serious accidents with explosives have involved AN. The Texas City catastrophe, of course, is best known.

Other safety precautions when using AN: (1)

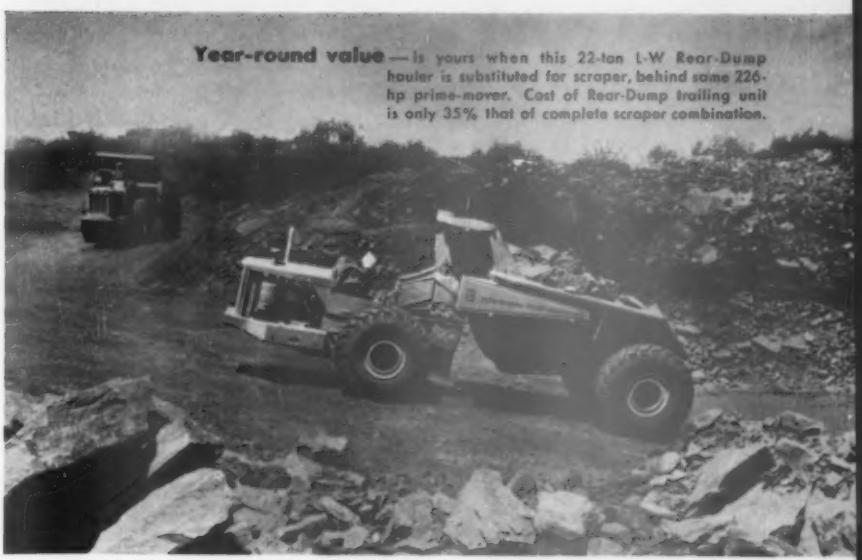
Please turn to page 116



Efficient stripping — is certain with this easy-loading 20-ton (18-yd) scraper. Large bowl capacity, and machine's easy maneuverability, speed removal of overburden. Use scraper, too, to repair old haul roads and build new ones, clean up odds-and-ends of earthmoving on your property.

For shallow stripping, this scraper's your best bet

gives you year-round service with interchangeable L-W Rear-Dump



Year-round value — is yours when this 22-ton L-W Rear-Dump hauler is substituted for scraper, behind same 226-hp prime-mover. Cost of Rear-Dump trailing unit is only 35% that of complete scraper combination.

Time means money when you're stripping varying depths of overburden in your pit. If overburden is free of rock, and is shallow and wide-spread, crawler-type excavators — such as shovels, draglines and crawler dozers — move slowly to new work areas, increase your costs. Furthermore, they can only dig and cast . . . require other machines to haul spoil to out-of-the-way disposal areas.

Self-propelled scrapers move shallow, non-rocky overburden at lowest cost per ton. Since stripping is a periodic job, most scrapers are sidelined many days during the year because there is not enough steady work. Not so with LeTourneau-Westinghouse C Tournapull®. When you finish stripping, you simply interchange its 18-yd scraper for a 22-ton Rear-Dump trailing unit. Thus your 226-hp L-W prime-mover works productively for you all the year-round for greater profit.

Cost of the interchangeable hauler trail unit is only 35% of that of prime-mover and scraper combinations. Other interchangeable L-W work units include Bottom-Dump, Side-Dump, and Flatbed haulers.

Tournapull "extras" speed operations

All off-road L-W Tournapull units have easy maneuverability for work in restricted quarters, instant electric control of all work functions. They have powerful brakes (largest in the earthmover field), dependable power-steer, and exclusive, power-transfer differential which keeps these machines working in soft going when other haulers bog down.

All-around usefulness, and interchangeability of hauled units make L-W 'Pull† a sound investment for your pit. Ask for complete specifications, and a demonstration.

†Trademark CPCR-1867-MQ-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

HOW TO HANDLE A-N EXPLOSIVES SAFELY

continued from page 114

It is best not to use it in underground mines, since highly toxic nitrogen oxides are formed in serious quantities in AN blasting. These compounds are 20 times as toxic as dreaded carbon monoxide, he pointed out. The reddish clouds of gas form in greatest quantities when the detonation hasn't been complete. Since many producers, to save money, are using low-cost detonators that may not give complete detonation, further precaution should be exercised. Even in surface quarrying, wait till the deadly, reddish nitrogen-oxide fumes have cleared from the area before loading shot rock, Mr. Van Dolah warned.

(2) Store AN separately from high explosives. While it isn't likely to be the first cause of an accidental explosion, it will go off very easily if detonated sympathetically. For greatest safety, it should be stored in a fireproof warehouse having sprinklers.

(3) At all times, watch to prevent compaction, confinement and friction conditions which could cause a blast.

(4) Don't use sugar, carbon black or other such materials for mixing with AN. And do not use crankcase drainings. No. 2 fuel oil is most commonly used, and works about the best.

Three quarts of oil per 80-lb. bag provide the six-percent mixture commonly used. While this gives maximum power, two to four-percent oil mixtures would give higher sensitivity, he added. Mix by pouring the oil into the AN bag, rather than pouring both in the blasthole simultaneously. The latter practice causes uneven mixing and will reduce power. Letting the mixed materials stand for two days gives time for good blending (though letting the mix sit several weeks does boost this effectiveness, a producer in the audience said.)

Other suggestions for most effective use of AN: Remember that the great variety of densities and coatings on commercial AN products will affect power and sensitivity, respectively. Keep in mind that uncoated prills generally have far more sensitivity, perhaps twice as much as coated. But they're likely to cake, for their resistance to water seepage usually is poor. Just a small percent of water absorbed in the prills will drastically cut sensitivity, Mr. Van Dolah advised.

Analysis of quarry injuries by type of hazard was the interesting subject of John Machisak of the Bureau of Mines. Mr. Machisak is chief of the Branch of Accident Analysis.

Breaking down quarry injuries by major types of hazards, he found a consistent pattern—more than half of reported injuries fall into just four categories. They are "falling material," "falls of persons," "machinery," and "handling material." The study should suggest new ways of looking at the problem, Mr. Machisak said, but won't necessarily give any answers directly on why accidents occur.

No reasons were given for the variations, but they clearly indicate a new tack producers may wish to explore in studying causes and cures for lost-time injuries.

Mr. Machisak reviewed his talk before the group of last year, in which he compared injury frequency rates for the various quarry industries. If producers had any doubts on effectiveness of organized safety programs, Mr. Machisak's figures quickly dispelled them. The cement rock industry, with well established, industry-wide safety efforts, has an injury frequency rate one-fifth as high as the other quarry industries! The following table is taken from the figures given:

INJURY FREQUENCY RATE
1953-57 range

Cement rock industry	4-5
Lime rock	20-25
Limestone	34-37
Granite	35-45
Trap rock	38-53
Sandstone	42-55

New general chairman of the rock industry's portion of NSC's safety activities is William A. Kipp, director of safety for Universal Atlas Cement Division of U.S. Steel Corp. He succeeds Paul Worseck of Lehigh Portland Cement Co. as leader of the group, officially called the Cement, Quarry and Mineral Aggregates Section.

Mr. Worseck was awarded a plaque by the section for his fine work in preparing this year's program and in coordinating section activities.

Mr. Kipp talked to the section about "Safeguarding new equipment." He mentioned several excellent ideas his firm has incorporated in its program. Examples: The best time to install safety equipment, such as guard rails and extra stop buttons, is when a new plant or addition is being erected. This extra equipment is cheapest and easiest to put in place at this time.

—Form a committee of one man each from your safety, engineering and operating divisions to inspect plans and installations on new plants. Their combined experience will uncover most places where accidents could happen.

Please turn to page 126

New, low-cost way to improve haul roads

There is new emphasis, these days, on road-maintenance in mines and quarries. Many pits now use blading equipment full-time on haul routes. Others are hard-surfacing their roads. Reason: auto and tire makers have proved that maintenance costs far less than slow hauling, excess tire wear, and equipment breakdowns caused by poor roads. Good haul surfaces boost production, lower equipment up-keep costs.

You can keep haul roads smooth, fast, safe, *at rock-bottom cost* . . . with no "extra" equipment, no more man-hours than you're now paying for, and no new personnel. Next time you replace a crawler-tractor, replace it with *rubber-tired* Tournatractor®. This LeTourneau-Westinghouse machine will handle all the work of the rig you trade in, and, because of its extra speed, take on a regular road-maintenance program as a "bonus" service.

Instant-shift, positive brakes, and electric blade control, plus speeds to 17.2 mph, make Tournatractor a fast worker. It's rugged, too. And, in a few minutes, it can leave its regular assignment and run, at 17.2 mph, to dig a drainage ditch, smooth a rutted road, clean silt off a bench, tidy up a stockpile, or do other tractor work. This "extra" service costs you nothing in added investment, operating cost or added personnel.

Move it anywhere . . . profitably

Key to this "double duty" ability is the fact that, unlike crawlers, Tournatractor is not "tied down" to one location, or one job, in your pit. Because it travels at 17.2 mph, you can move it around at will . . . easily, quickly, efficiently. Tournatractor can often leave its "regular" job, get to any part of your road system in a few minutes, do a quick maintenance job, and return to its normal assignments before it is missed.

Trying the same plan with a track-rig rarely works. First of all, you seldom can spare the time a crawler needs to get anywhere. And if you *do* have time, the 5-to-6 mph crawler spends most of it just traveling. Also, scheduling a crawler on a 4 or 5 mile per day travel circuit costs plenty in track wear and repairs.

Time for roadwork easy to find

Finding time for Tournatractor's roadwork is easy. This high-speed unit can clean up at several shovels, still find time to do roadwork — plus other plant and stockpile clean-up — in-between clean-up sessions along the working face. Many pits have found that just one Tournatractor can replace two or three crawlers and handle *all* "miscellaneous" grading and pulling jobs as well as shovel clean-up.

For all its mobility and speed, Tournatractor is a hard worker, too. Massively, ruggedly built, it offers 210 hp . . . delivered through an anti-friction drive and torque converter to four, wide, low-pressure tires . . . for positive traction on any surface.

Let us send you complete details on how "go anywhere" Tournatractor can easily handle road maintenance in your pit at no extra cost.

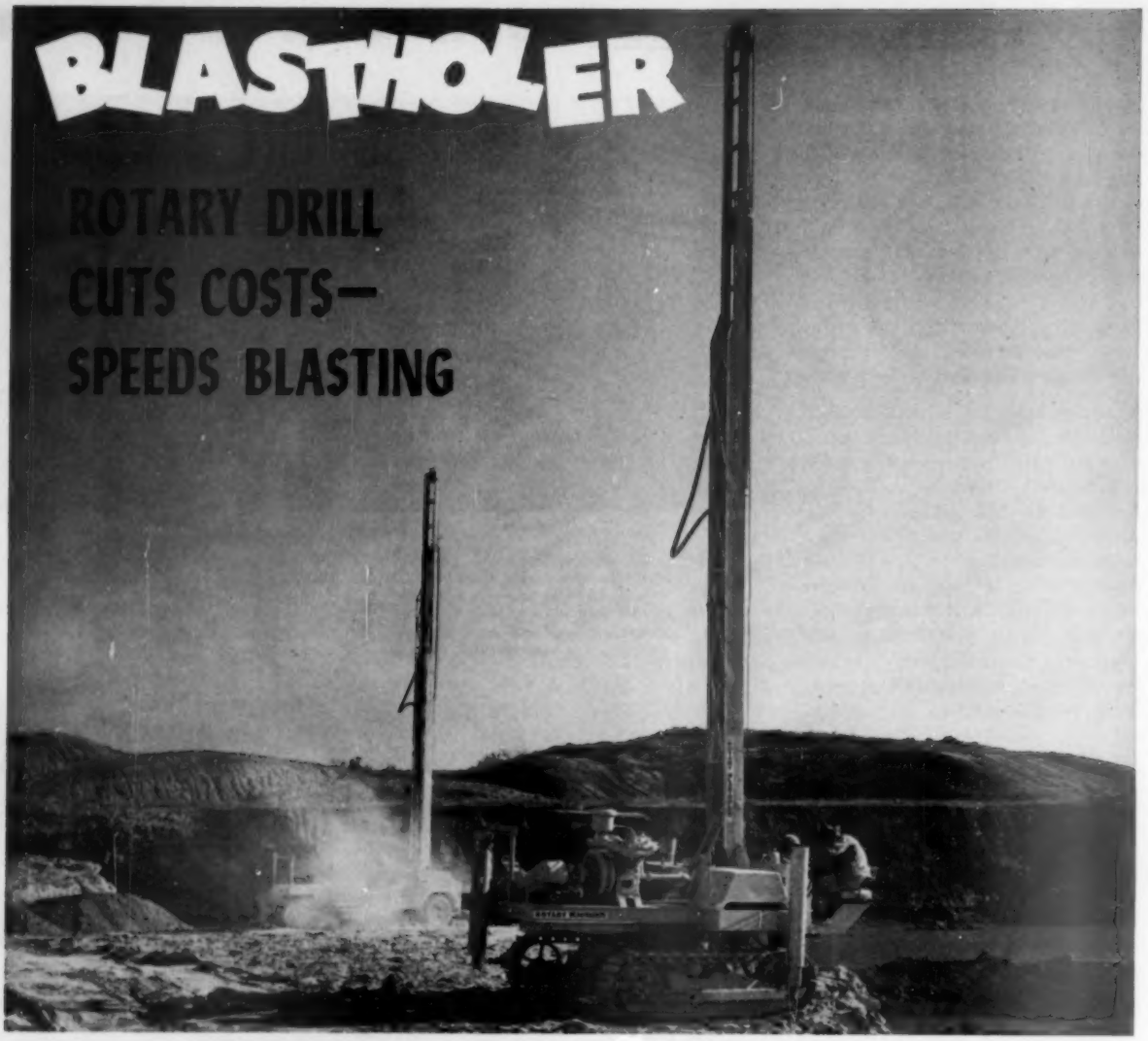
CT-1647-MQ-1

LW

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit



BLASTHOLER

ABOVE: Track and tire-mounted BLASTHOLERS drilling 25' blast holes without adding steel in a hard limestone quarry.

This self-propelled rotary drill can really start your production on the up-swing — save you money, too! 2 to 5 times faster than other cumbersome equipment, the BLASTHOLER requires only one operator, carries own air for cleaning hole. Standard BLASTHOLER drills 20' holes 3" in diameter without adding steel. Optional equipment gives you depths to 50'. BLASTHOLER mounts on tracks or dual pneumatic tires to meet your terrain requirements. Cut costs — speed blasting! See the BLASTHOLER today!

BLASTHOLER DEALERS

The W. W. Williams Co.
Columbus, Ohio

Reid-Holcomb Co., Inc.
Indianapolis, Ind.

Watson Equipment Co., Inc.
Pittsburgh, Pa.

Ray C. Call Co., Inc.
South Charleston, W. Va.

Illinois Road Equipment Co.
Springfield, Ill.

Williams Tractor Co.
Louisville, Ky.

Hi-Way Machinery Co.
Dallas, Texas

Bublitz Machinery Co.
North Kansas City, Mo.

James W. Bell Co., Inc.
Cedar Rapids, Iowa

Anderson Equipment Co., Inc.
Omaha, Neb.

Wylie-Stewart Co., Inc.
Oklahoma City, Okla.

Wisconsin Drilling & Equipment Co., Inc.
Madison, Wis.

Contractors Machinery Co.
San Antonio, Texas

DRILLING ACCESSORY AND MANUFACTURING COMPANY, INC.
2006 South Industrial Boulevard — Dallas, Texas

Enter 1224 on Reader Card

ROCKY'S NOTES

continued from page 16

Rock-forming minerals are treated in Chapter 4. The common minerals in rocks such as quartz, feldspar, etc., are described scientifically and atomically. The most important atomic structure in rocks is, of course, the various systems or linkages of the silica tetrahedra (SiO_4). One cannot study the structure of silicate rocks without seeing some comparison or analogy with concrete.

The origin and classification of igneous rock is a subject that needs no emphasis as to its importance to those who quarry and utilize such material. It is a subject frequently discussed in association proceedings of producers of mineral aggregates.

The chapter on soil-forming processes is important to our industries not so much from the resulting soil angle as it is in describing the vicissitudes that man-made rock or concrete must endure. No natural rock is entirely resistant to weathering, but some are much more so than others. Unfortunately, concrete does not compare well with most natural rocks in its resistance to soil-forming processes, largely (apparently) because the binding medium or cement is too alkaline.

The chapter on streams, studied in connection with the one on soil materials, should prove helpful in locating certain kinds of sand and gravel deposits. It is also important, of course, in determing water supply for plant purposes. In the chapter on ground water there is an interesting and helpful discussion of capillary effects, or the movement of water upward through soil pores. This is a frequent cause of concrete pavement failures now being corrected in most new work by placing a bed of nonporous or coarsely porous sand, or crushed stone or slag screenings, between the clay subsoil and the pavement. Those interested in the mathematical analysis of the process will find it here.

The processes associated with glaciation are interesting and helpful in prospecting for glacial deposits of sand and gravel. Most of the excellent sand and gravel deposits of the North Central states are the results of processes associated with glaciation. If one wants to know what are drumlins, moraines, outwash, Kames, eskers, varves, etc., he will find the answers here.

Perhaps our greatest interest should be the chapter on sedimentary rocks, for here nature has cemented rock fragments and other soil aggregates into rocks, most of them far superior to manmade rock or concrete. Sedimentary rocks are divided into two major groups—clastic and nonclastic. Clastic rocks are composed of individual mineral particles cemented or bonded together; nonclastic rock are chemical precipitates (gypsum and some limestones, for example). Hence, concrete is an artificial clastic rock.

Please turn to page 121

FIRESTONE'S 24-HOUR TIRE SERVICE

helps you make bigger profits on lower bids!

Firestone *Giant Tire Service* keeps equipment working around the clock

Firestone's *Giant Tire Service* puts a Firestone off-the-highway Tire Expert on your job *whenever* you need him. With his completely equipped service truck, he'll handle all your tires from the biggest to the smallest. He'll check your tires regularly for proper inflation and spot potential trouble areas before they develop. Combine Firestone's Giant Tire Service with Firestone off-the-highway tires to bring down tire costs. There's a tubeless or tubed tire built with Firestone Rubber-X, the longest-wearing rubber ever used in Firestone tires, for every construction job. Call your Firestone Dealer or Store about Firestone's Giant Tire Service today.

Rock Grip Excavator® Wide Base Rock Grip Excavator

Enter 1237 on Reader Card

ROCKY'S NOTES

continued from page 119

The binding, bonding or cementing material in clastic rocks may be a variety of materials, sometimes helped by interlocking particles or aggregates. The strongest bond in nature is the silica cement which binds particles of silica into quartzite. This is so, says our author, because "individual mineral grains are complexly interlocked by addition of quartz to these grains." The cementing silica or quartz, of course, comes into the pores in the aggregate grains as a solution, or a colloidal material.

The author states further: "Indeed, well cemented rocks are those in which the chemical end member is an important fraction of the rock." We take this to mean that the best binder for a limestone is calcium carbonate, just as silica is the best binder for silica particles. In other words, a silica rock bonded or cemented with calcium carbonate is unstable from the very fact that being mutually reactive one dissolves the other, just as a calcium carbonate rock bonded with silica might be. From this angle, portland cement is a compromise, being a hydrated calcium silicate. It probably would be a better compromise if the calcium and silicon end products were more evenly balanced.

The rest of the book deals with the more common aspects of descriptive geology. We hope we have made it plain, however, that the book as a whole presents a treatise on geology more helpful to those who delve into the earth's crust for such treasures as sand, gravel and stone, than the ordinary run-of-the-mill geology textbook. **END**

NEW "TOOLS" SLICE COSTS

continued from page 88

or groups engaged in related activities. Reports of cost and performance are the basis for the control of these items.

To put costs under control, the operations that account for the expense must be brought under control. This is accomplished through realistic standards of production, performance, materials, time or cost. The standards may be rigid and precise, as in the repetitive operation of a large dragline or shovel; or the standards may be approximate and applied loosely to detect unusual occurrences. Examples of this are: major equipment repair or overhaul, brick or refractory lining jobs, standby fuel changeover, or the complete relining of a mill shell.

Planning and scheduling for production can be improved by using standard charts or tables of manning for operations performed by teams or

Please turn to page 122

NEW "TOOLS" SLICE COSTS

continued from page 121

groups. Standards are also useful in preparing budgets, for production cost estimating and for auditing systems and procedures; also for determining the need for and the actual contribution of various functions.

After work simplification and time study in productional operations, other areas can be opened for study, such as: wage and salary administration, organizational structure, internal communications, capital appropriations and expenditures.

There are a number of excellent sources for the industrial engineering approach to specific problems. During the past two years articles have appeared in Coal Age, Mining Congress Journal and the Journal of Industrial Engineering. Perhaps the most useful pair of articles to be written recently are "The Role of the Industrial Engineer in the Mining Industry," by I. K. Hearn, American Mining Congress Journal, December, 1957; and D. Reid Weedon, Jr.'s paper read at the Industrial Minerals Convention, American Mining Congress, September, 1957. This offered some answers to the question, "What can research do for management problems in mining?" END

GOOD HOUSEKEEPING

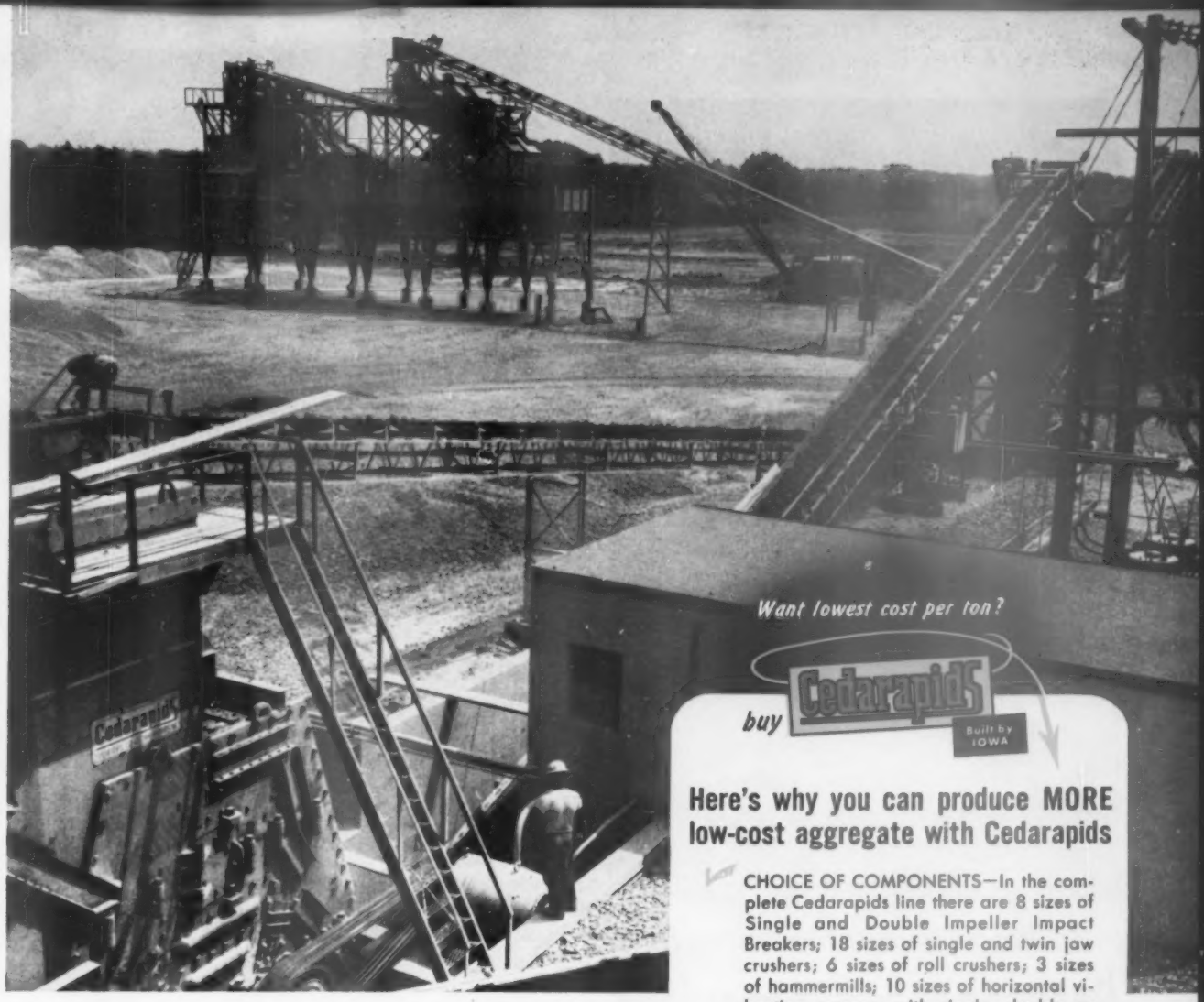
continued from page 105

a grease fitting after greasing and then throw the rag in a trash barrel instead of on the ground. Have your repair men clean up after repairs are completed. Remind them of the fact that you do not have a special crew to do the cleaning. You will get results if you keep trying.

If the program is carried out properly, each man will learn to clean up his own work area, making it unnecessary to pay men just to do housekeeping. Still, one day each week a crew should go around and, under proper supervision—and this supervision is very important, do the "general" clean-up, such as removing accumulated waste piles and emptying trash containers. At Eliot, we use two men for this one-day clean-up. Sometimes they work only three or four hours on this job.

Once in a while you'll have to reprimand an employe about keeping things in shape, but when he cleans up you can tell him that he did a good job. In fact, employes get so they like to see things clean and to be complimented on it.

A clean plant sells our products. This is another important reason for good housekeeping—it presents a better picture to the public. A customer coming out to one of our plants can't help being affected by what he sees. *Please turn to page 124*



Want lowest cost per ton?

buy Cedarapids Built by IOWA

Here's why you can produce MORE low-cost aggregate with Cedarapids

- CHOICE OF COMPONENTS—In the complete Cedarapids line there are 8 sizes of Single and Double Impeller Impact Breakers; 18 sizes of single and twin jaw crushers; 6 sizes of roll crushers; 3 sizes of hammermills; 10 sizes of horizontal vibrating screens, with single, double or triple decks.
- CAPACITY-BOOSTING AUXILIARY EQUIPMENT—Vibrating grizzlies; washing plants; washing attachments; feeders; conveyors; bins.
- BALANCED PRODUCTION—Each Cedarapids component you need is recommended not only as to the type that best handles your quarry conditions, but also to match every other component in the plant for balanced output. Only Cedarapids has the complete line of components to make this possible!
- SKILLED ENGINEERING—Cedarapids engineers have been analysing and solving problems similar to yours for 36 years. Put their production-wise experience to work for you *now!*

Cedarapids "tailors" each stationary plant to each job requirement

Your aggregate producing problem is different from any other in the world. That's why Cedarapids maintains a special engineering department to "tailor" your stationary plant to your particular job for the most profitable production. Take advantage of Cedarapids engineers' field experience, their intimate knowledge of rock and salable rock products, their skill in combining the right components to give you extra tons per hour while saving money on lower maintenance and reduced operating costs. Call in a Cedarapids engineer *before* you plan your plant. Ask your Cedarapids Dealer for details.

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U. S. A.

THE RIGHT COMPONENTS, PRODUCTION BALANCED FOR EACH JOB, ASSURE HIGHER PROFIT . . .

Twin-Jaw Crushers, exclusive with Cedarapids, increase crushing capacity from 40% to 100% over comparble-size single jaw crushers.

Cedarapids Roll Crushers assure high capacities of small sized aggregate at lowest cost per ton.

Cedarapids Horizontal Vibrating Screens have 12% greater screening area than same-length inclined screens; give 20 to 30% more effective gradation.

GOOD HOUSEKEEPING

continued from page 122

We are always happy to take visitors on tours of our plants. They notice our housekeeping and never fail to talk to us about it. We call their attention to the appearance of our rolling equipment and let them know that although it is seven or eight years old, it not only looks new because it is clean and painted, but is in first-class operating condition. In fact, in a good many cases equipment operates better now than it did when we first installed it.

To sum up: Once you get a housekeeping program started, keep at it day after day and never give up. A clean orderly plant pays off in operational efficiency, improved worker morale and public relations . . . and under proper supervision, it costs very little. END

AMERICAN MINING CONGRESS

continued from page 89

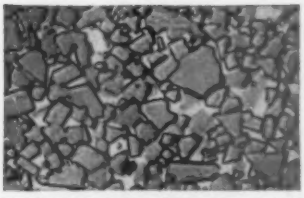
to place the transportation unions of this country under the anti-trust laws."

A symposium which examined our national mineral policies developed into a discusison of what they are not. It seemed obvious from the statements of Senator Gordon Allott (read to the meeting) and Thomas R. Rawlings of the Agriculture Department that the administration has no definite minerals industry policy but permits other policies to govern instead. As a result, according to C. Hyde Lewis, president of New Idria Mining Co., the strategic minerals industry is dead.

Growth and progress were predicted for industrial minerals, including metals with more industrial applications than the so-called strategic minerals. Spokesman for this attitude was F. B. Shay, vice president of Foote Mineral Co. The booming construction industry will call for ever-greater output of asbestos, cement-making minerals, gypsum and structural clays. Production tonnage and dollar values of these minerals are at an all-time high and probably will get higher.

A consensus of a number of the hard-rock miners and manufacturers of mining equipment seemed to bear out the despondent outlook for metals mining. However, no one individual would admit that his situation was as bad as the speakers outlined. Machinery manufacturers expressed some delight that the drop in equipment orders was not as severe as they had anticipated. But they did agree that machinery was easier to sell when real and immediate savings in labor or overhead could be promised. *Please turn to page 126*

Longer bit life— with *new* Sandvik Coromant Bits



Sandvik Coromant Tungsten Carbide (Microphoto) Uniformity of size, even distribution of grain are marked. Free from porosity and impurities —therefore stronger, longer-lived.

Low quality Tungsten Carbide (Microphoto) Black marks are contaminations caused by deficient production control. They weaken the carbide, reduce its working life.

NEXT time you buy bits, specify Sandvik Coromant because they give more footage per bit, lower drilling costs. Here's why:

1 Only first-quality tungsten carbide is used —as shown in the microphotos above. This means less wear, longer life and a better job.

2 The bodies are precision-made of high quality alloy steel—tough enough to take the strain throughout the extra-long bit life.

3 The bigger Sandvik Coromant bits are all of X-design, which prevents rifling. No wonder Sandvik Coromant inserts are the most widely used in the world, drilling more than one billion feet every year.

SANDVIK COROMANT bits are supplied through Atlas Copco, the world's largest manufacturer of rock drills, who also supply Sandvik Coromant integral steels — the most widely used in the world — and Sandvik Coromant extension steel equipment.

Sandvik Coromant Detachable Bits are Available in the following Thread Sizes and Bit Diameters

Available Diameters, in Inches

Type	Thread	1⅛	1⅜	1½	1⅝	1¾	1⅞	2	2⅛	2¼	2⅜	2½	2¾	3	3½	4	4½	5
SHOULDER	TAPER	x	x	x	x													
	F		x	x														
	113		x															
	H			x	x	x	x	x		x								
	115			x	x													
	D						x	x	x	x	x	x	x	x				
	K													x	x	x	x	
BOTTOMING	1" Rope				x	x	x	x		x								
	1¼" Rope						x	x	x	x		x		x				
	400						x	x		x		x						
	1½" Rope											x	x	x	x	x		
	600											x	x	x	x			
	700													x	x			
	J7.5															x	x	
	2" Rope														x	x	x	x
	1000																x	

Write or phone today for further details to either of the addresses below:

610 Industrial Avenue
Paramus, New Jersey
COlfax 1-6800

Atlas Copco

930 Brittan Avenue
San Carlos, California
LYtell 1-0375

Enter 1269 on Reader Card

AMERICAN MINING CONGRESS

continued from page 124

This point was amplified by Dr. David C. Minton, vice president of Battelle Memorial Institute. Said he, "You have two major advantages over your foreign competitors—proximity to the world's greatest market . . . and superior technology." Even with high labor wages, American mines often can compete with the output of foreign mines in the world's markets. END

NATIONAL SAFETY CONGRESS

continued from page 116

—It's a good idea to spend a little extra time and thought "engineering out" accidents before they happen. For example, Mr. Kipp presented a color slide showing how a motor and drive were moved from a hard-to-reach spot. They were dropped a foot or two so the lubrication and maintenance people could reach them easily from an exisitng platform, instead of having to reach up or climb a ladder or guard rail.

Portland Cement Association's Ivan LeGore showed the group a movie PCA has just finished. The 33-min. color show uses humor and lively action to spice up a presentation of what can be a rather boring, albeit vitally important subject.

The "star" is a plant worker who learns from his 11-year-old son a lesson in growing up to his responsibilities for safe conduct. The movie digs deep into the human, rather than mechanical, causes for accidents and in so doing brings out the safety value of teamwork, observance of rules and instructions. The film can be purchased from PCA, 33 W. Grand Ave., Chicago, Ill., for about $153. Not enough copies are available to permit loaning or renting it out, Mr. LeGore said. END

APPROACH TO CRUSHING PROBLEMS

continued from page 98

Oversize feed. Reduce material in crusher ahead of the mill.

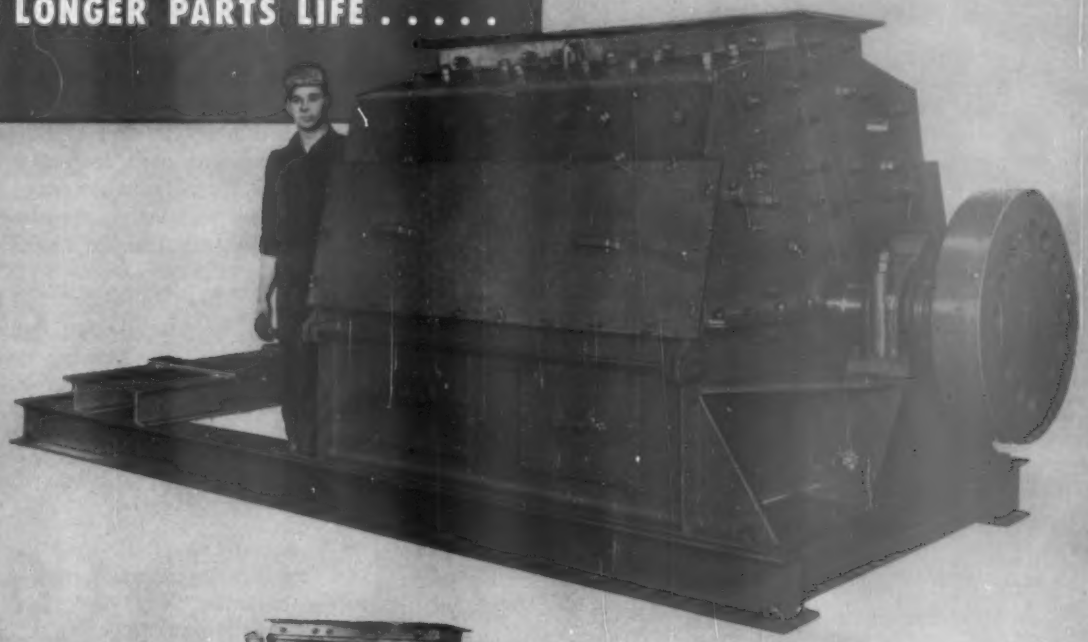
Improper set of air separator. Determine best whizzer blade pattern and make sure the separator is cleaning the product out of the separator tails.

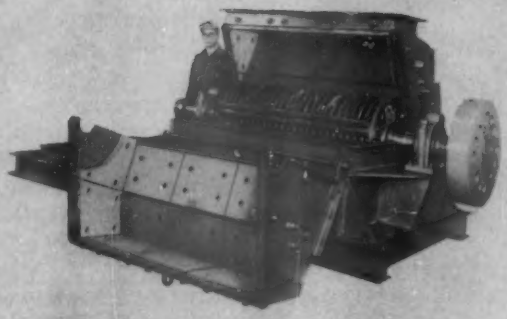
Materials handling. Make sure that elevators, screws, conveyors and drags are large enough, are not plugging and are operating smoothly.

There could be many other causes or a combination of problems. In any event, the work index will point out whether trouble exists and start the operators hunting for the causes. By achieving efficient grinding, costs automatically will come down.

NEW DUAL "2-POINT" ADJUSTMENT INSURES MORE UNIFORM GRINDING, LONGER PARTS LIFE . . . . .

WILLIAMS *Reversible* HAMMER MILLS





Williams Reversible Hammer Mill with cover open. Note these features:

- Super-strong reinforced steel plate frame
- Renewable wear-resistant manganese steel liners
- Heavy duty oversize forged steel rotor shaft
- Anti-friction self-aligning roller bearings in dust-tight housings
- Complete accessibility to interior for quick parts changing

It's another Williams "first"—features not available in other hammer mills—that now makes it possible to maintain the original close clearances of *both* grinding plates *AND* cage sections against the rotating hammers. This easy-to-make "2-point" adjustment, in the most critical grinding area inside the hammer mill, gives absolute assurance of consistently uniform product quality.

In addition to the advantages of the Dual "2-Point" Adjustment, a Williams Reversible Hammer Mill substantially lowers upkeep expense by cutting hammer cost. Hammers can be operated in one direction today and another tomorrow simply by installing a simple reversing switch on the driving motor. Manual reversing of hammers no longer necessary. Grate bars also last longer. The double set of reversible manganese breaker plates, which last twice as long as other types, give four times the service! Maintenance and downtime are cut 50% or more.

Get all the facts about the hammer mill with *ALL* the top features.

WILLIAMS PATENT CRUSHER & PULVERIZER CO. • **800 ST. LOUIS AVE.** • **ST. LOUIS 6, MO.**

Roller Mills | Helix-Seal Mills | Air Separators | Vibrating Screens | Feeders | Impactors

WILLIAMS

CRUSHERS · GRINDERS · EMBODIERS

Oldest and Largest Manufacturers of Hammer Mills in the World

Enter 1225 on Reader Card

NATIONAL SAND & GRAVEL ASSOC.

continued from page 102

The short course on concrete and concrete aggregates is one of the most popular activities of the associations, according to Stanton Walker. It's so popular that more room will have to be provided to accommodate those who wish to take the course. This year, it was held November 16-20 at the University of Maryland.

The new highway program may cost $50 billion before it is completed. And there never will be an end to a highway program in the United States, according to Mr. Ahearn, executive secretary of both associations. In his usual capable way, he reviewed several federal legislative questions, bringing a most interesting analysis of "behind-the-scenes" developments in each case.

The next mid-year meeting of the board will be held October 3-5, 1960, at Del Monte Lodge, Pebble Beach, Calif. END

NATIONAL LIME ASSOCIATION

continued from page 108

Every day you invest in men, machinery and materials deposits—the three "M's." Investing in each bracket gives an opportunity to gain a return on that investment. Mr. Goerbing defined "return on investment," and explained its value to any company or operation, how it works and the importance of central procedures. Manufacturing costs are most important. If a return on investment is to be maintained, you should make an unrelenting attack on production costs, Mr. Goerbing warned.

What's the best way to get a good safety record? A panel on the subject of "Practical Safety Ideas and Procedures" offered several good methods. Cooperation of top-level management with local management was the prescription recommended by C. E. Baxter, Ash Grove Lime & Portland Cement Co. A six-step, proven program was suggested by E. C. Beuthin, U. S. Gypsum Co. "Work continuously to eliminate accidents and prevent possibility of new ones" was the method used by D. K. Russell, Ohio Lime Co.

The lime industry is making progress in safety. Specifically, two companies completed 1958 without a lost-time accident. They were Marblehead Lime Co. (five plants) and Ash Grove Lime & Portland Cement Co. (two plants). One plant of the latter company has gone (as of October 1959) more than 3,500 days without a lost-time accident.

Only Gardner-Denver offers 6 crawler drills for your choice

Swing Boom "Air Trac"® (Model ATD3000)—drills more holes from one position . . . reaches out to 2½′ on both sides of track for a total reach from side to side of 11′10″ with boom at 45° elevation . . . drills horizontal holes to 9′6″ above ground level. Like all "Air Trac" models, it is self-equalizing, self-stabilizing . . . moves safely, easily over rough terrain.

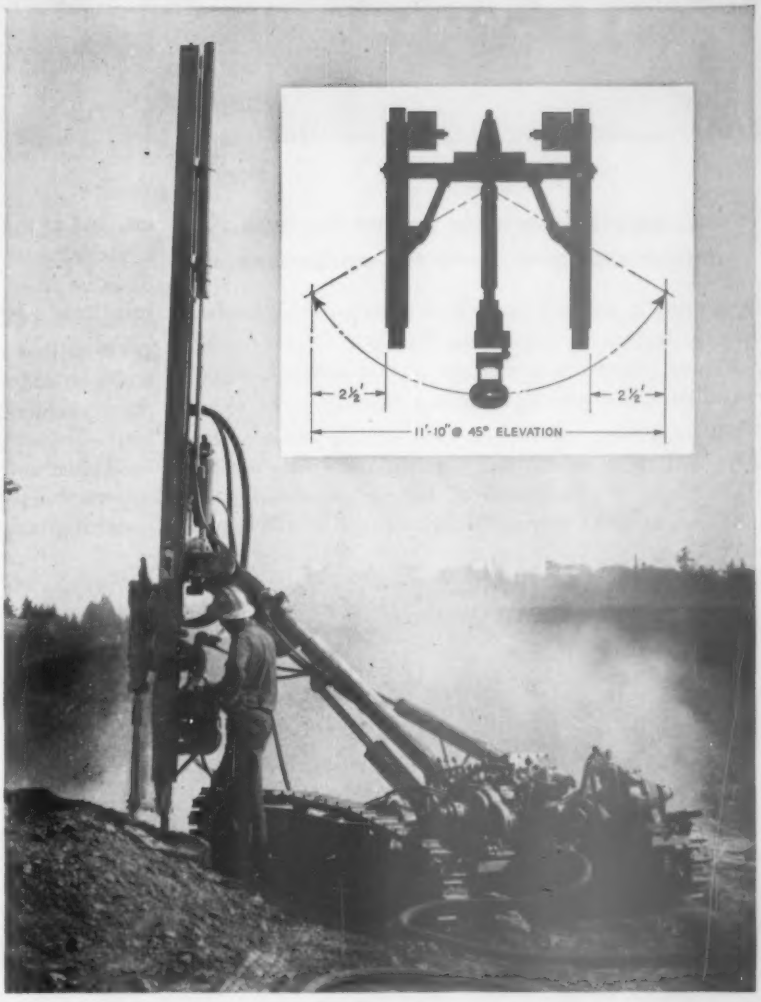
"Air Trac" (Model AT)—the first crawler drill . . . the carrier that made the wagon drill obsolete . . . still the only rig designed to level itself when riding over rough, rocky ground.

Model AT50—"Air Trac" with hydraulic drill positioner and hydraulic remote controls.

Model AT1000—with longer tracks and heavy-duty traction air motors for greater stability in severe terrain.

Model AT1500—like AT1000, has longer tracks and greater traction power. Designed for complete power positioning with hydraulic drill positioner and hydraulic remote controls.

Model HT-143—biggest and most powerful crawler drill available . . . carries the hard-hitting Gardner-Denver 5½″ drill.



Plus . . . the most complete line of field-proved drifter drills available . . . and quality, longer lasting Gardner-Denver sectional drill rods, couplings, and ring seal shanks.

Write for bulletin.

EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

GARDNER - DENVER

Gardner-Denver Company, Quincy, Illinois

In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario

SETTING THE PACE

The trend to crawler drills in recent years was pioneered by forward-looking engineers and construction specialists who developed the Gardner-Denver "Air Trac," another example of Gardner-Denver's 100-year philosophy of growth—*there's no substitute for men.*

GARDNER-DENVER Since 1859 100 1959 YEARS

Enter 1301 on Reader Card

engine power
BY CATERPILLAR

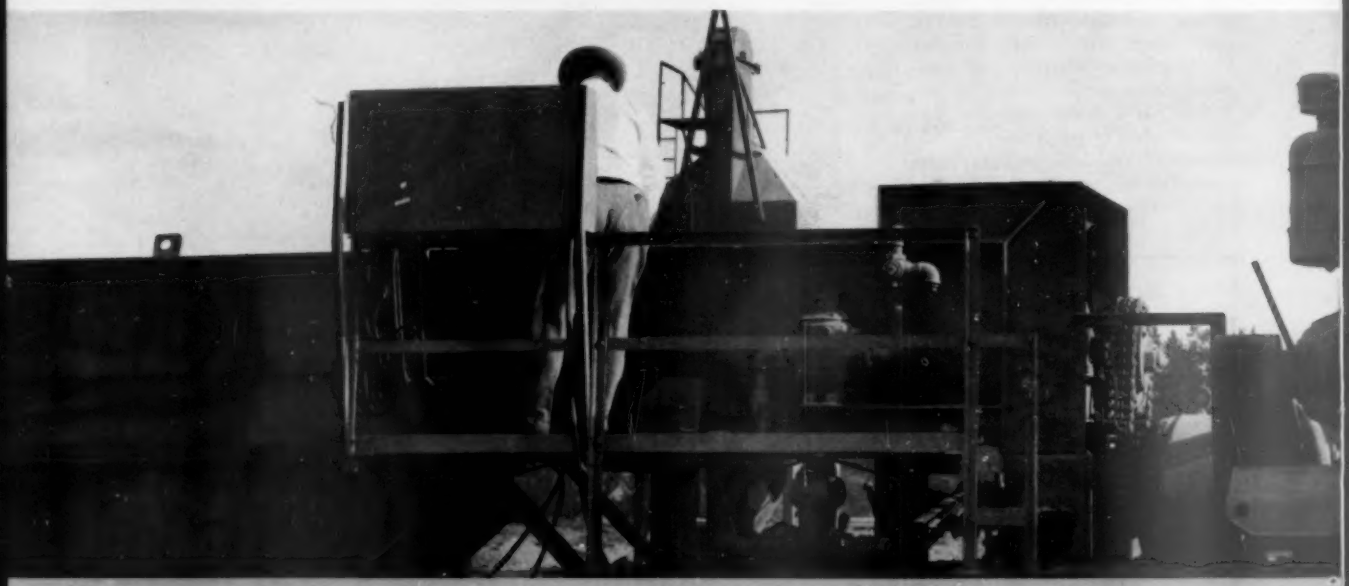
CAT "TWO-HANDED" OF BASE

. . . supplies *portable* power for *both* mechanical and electrical equipment

In Wyoming, where a lot of base stabilization must be done in highway construction, Wyoming Paving Company was awarded a late season paving contract where maximum plant production was a must.

Wyoming Paving Company solved their power problem—and their production problem too—with a Cat D337 Series F "Two-Handed" Engine. This Cat unit provides direct mechanical drive, through a clutch, on one end of the diesel engine shaft. Simultaneously, an electrical generator on the other end is capable of handling up to 60 KW of 240-volt, 60-cycle, 3-phase electrical load. Total rated output of the unit is 230 BHP.

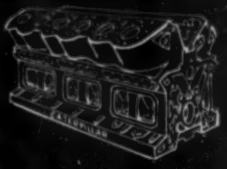
With this ample power, Wyoming Paving Company has been able to double the manufacturer's minimum plant production and produce 550 tons of material an hour—occasionally as much as 600 tons. The compact Caterpillar unit has helped them speed construction of an important section of Interstate Highway 25 in Wyoming —and it gives them convenient, portable power for their



Caterpillar's own foundry casts engine blocks of a special high-tensile-strength alloy, 50% stronger than ordinary gray iron castings. Further rigidity and strength are provided by numerous ribs and partitions.

Cat Generators have outstanding heavy motor starting ability, are simple and compact with no moving parts in the voltage control system. Output terminals are conveniently located for connection to panel or load. Generators are *matched* to engines.

Your Caterpillar Dealer Engine Specialist is your diesel power consultant. He's backed by quality parts reasonably priced, and a skilled staff of factory-trained servicemen. Call him now to avoid problems later.



CDES

ENGINE DOUBLES USUAL OUTPUT STABILIZATION PLANT

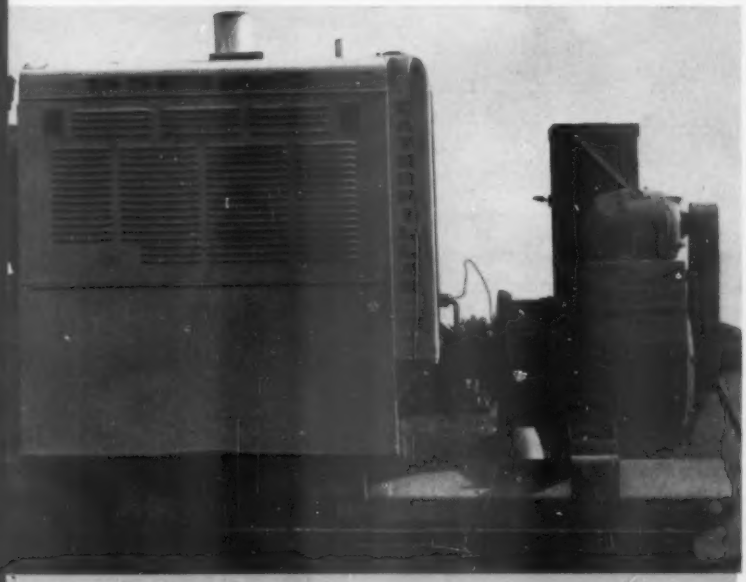
crusher and hot plant or for lighting when the unit is not needed for base stabilization.

The D337 Series F is just one of *nine* basic Cat Engines. Capacities range from 75 to 700 horsepower. This line of versatile Cat Engines saves space, gives you portable power for every purpose, and saves money where you need both mechanical and electrical power.

Your Caterpillar Dealer Engine Specialist can help you choose the best size and type for diesel power, generator or combination drive applications. He can help you with *any* problem or question you have concerning diesel power. Call him for repowering assistance or for advice in selecting the proper engine for new plants, excavators, dredges, compressors or locomotives.

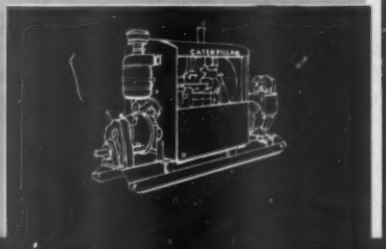
CATERPILLAR

Engine Division, Caterpillar Tractor Co., Peoria, Ill., U. S. A.



Turbocharging is standard on most Cat Engines, giving more power per engine weight to make possible a much smaller engine package for a given horsepower.

Nine basic Cat two-handed Engines range in size from the 700 HP (maximum output rating) D397 Series D to the 75 HP D311 Series H. These can be matched with generators to meet your exact job requirements.



NEW LITERATURE

For further free information on items identified by key numbers, simply fill out and mail the postage-paid Reader Service Card found elsewhere in this issue.

36-in. hydraulic crusher

ALLIS-CHALMERS MFG. CO. has released a new brochure describing mechanical features of its 36-in. Hydrocone crusher. Bulletin 17B9296 describes the unit's instant hydraulic adjustment for wear and product size, its low height of 4 ft. 10 in. and the choice available of crushing chambers for fine and coarse crushing.

Enter 600 on Reader Card

Generator sets to 230 kw.

D. W. ONAN & SONS, INC. has published its 1960 Electric Plant Catalog. The line of gasoline and diesel engine-driven generator sets comes in 45 basic models. Units from 500 watts on up are described in the brochure, Catalog F-146.

Enter 601 on Reader Card

Improved fiberglas bags

MENARDI & CO. has announced a bulletin describing its new No. 600 Maco-Glas filter fabric, which gives a major improvement in permeability rating, thus giving big gains in efficiency and economy. While the No. 600 fabric gives a permeability rating of 81 cfm. per sq. ft., only 17 cfm. per sq. ft. was available previously. No filtering efficiency is lost with the new fabric, Menardi reports.

The bulletin, "The Modern Solution to Fume and Dust Filtration Problems," also notes that: Menardi conceived and pioneered the modern glass fabric filter bag; the bags maintain their original permeability throughout their life; they operate at temperatures in excess of 500 deg. F.; they require no shaking, only a simple, periodic collapse.

Enter 602 on Reader Card

10-yd. quarry dumper

KOEHRING DIVISION is distributing a new bulletin on its model 100, 10-cu. yd. Dumptor, an off-highway hauler. On-the-job views, its two-way controls, instantaneous dump (and gravity-controlled dump) and its ability to increase yardage hauled through its no-turn operation all are given.

Enter 603 on Reader Card

Bureau of Standards research

NATIONAL BUREAU OF STANDARDS, Washington 25, D.C., has released its annual 1958 "Research Highlights" for the year. Projects which will interest rock producers include "New Data on Silicates . . ." "Chemical Analysis of Cements," "Degradation of Asphalt" and "Drying Shrinkage of Concrete Masonry Units." The 138-page booklet may be purchased for 45 cents in cash or check from the Supt. of Documents, U. S. Government Printing Office, Washington 25, D.C.

Enter 604 on Reader Card

Dump-trailer bodies

GALION ALLSTEEL BODY CO. is making a new booklet called "Let's Talk Trailers." How to haul larger legal payloads and cut hauling costs is described in the booklet, Galion reports. Some features: floor sheet tied directly into body side sheet, to assist as a tension member; side braces are wider (6 in. versus 4 in.) at the base to insure against the sides spreading without the use of tie rods; self-cleaning rub rails.

Enter 605 on Reader Card

Industrial tractor

NAPCO INDUSTRIES, INC. is distributing a brochure on its new four-wheel drive, four-wheel steer industrial tractor. The 52-hp. rubber-tired unit has attachments which include dozer blade, forklift, snow plow, winch and street sweeper. Features of the basic tractor include power steering, torque converter, hydraulic reversing clutch and planetary axles. Top travel speed is 23 mph.

Enter 606 on Reader Card

Drill steel and bits

BRUNNER & LAY, INC. is distributing catalog 759, describing its complete line, including carbide Rok-Bits, drill rods, striking bars, extension steel and other tools.

Enter 607 on Reader Card

Adjustable speed drive

The LOUIS ALLIS CO. recently published Bulletin 3600, outlining the Allispede mechanical adjustable speed drive, available in ratings from 1 to 30 hp. Operating on ac. power, the Allispede offers speed ranges up to 8 to 1. Various modifications may be made, such as remote controls, mounting flanges, brakes and remote speed indicators.

Enter 608 on Reader Card

Slurry density gage

OHMART CORP. has released Bulletin SG describing its nuclear density gage. It is used for continuous, non-contact measurement and control of percent of solids in a slurry. Units bolt around lines 4 to 14 in. diam.

Enter 609 on Reader Card

(Continued on page 134)

Enter 1218 on Reader Card

Only BAGPAKS® have a built-in insurance policy backed by International Paper

ACCIDENTS like this *will* happen. That's why International Paper plans for extraordinary stresses and strains when designing its Bagpak multiwall bags.

Only genuine *Gator Hide*® kraft, famous for toughness, is ever used in making Bagpak multiwalls. Quality is controlled every step of the way. International Paper can do this because it grows its own trees, makes its own paper, converts it into printed multiwall bags to your order. It also designs and builds *Bagpaker*® machines that can package up to 60 tons of material per hour!

When you buy Bagpak multiwall bags you get speedy shipments geared to your production schedules. *Twenty-one* sales offices and four strategically-located plants save you money by keeping your inventory at a minimum.

Only Bagpak multiwalls are backed by the full resources of International Paper—world's foremost pulp, paper and paperboard producer.

Next time your Bagpak field service engineer drops by, ask him what's new. He knows.

Bagpak Division **INTERNATIONAL PAPER** New York 17, N.Y.

NEW LITERATURE

(Continued from page 132)

335-hp. crawler tractor

CATERPILLAR TRACTOR CO. has released a brochure giving features of its new D9 series E crawler tractor with exclusive new Power Shift transmission. Besides the new transmission, features include horsepower boosted to 335, a new equalizer bar which puts more weight on the uphill track and hydraulically controlled bulldozer blade.

Enter 610 on Reader Card

Refractories handbook

WALSH REFRACTORIES CORP. has issued a revised version of its "Refractories Handbook," describing its refractory products more completely. New listings include FC-191, a Fusion-Cast material, and Insulflux, a low K-factor insulating refractory. Additions to Walsh's general refractories line include H & B Castable #28; Hi-Al (high Alumina) castables; Walram Plastic, high alumina refractory for high-temperature jobs; Silica Cement and Zircon Fire Brick.

Enter 611 on Reader Card

Excavator-hauler

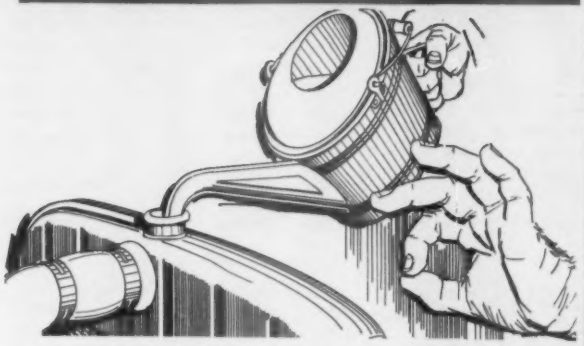
SANFORD-DAY IRON WORKS, INC. is distributing Bulletin B200, describing its Gismo Transloader, a self-loading unit for loosened rock and earth materials. The front-loading, bottom-dump unit, operated by one man, reportedly moves 70 to 120 tph. of material over hauls of several hundred feet. It permits unusually low capital investment and gives the lowest possible cost per ton (estimated at 11 cents) for maintenance, the maker states.

Enter 612 on Reader Card

(Continued on page 136)

LUBE LOGIC

Four ways to lighten your load this month



NEW WAY TO KEEP RUST OUT OF YOUR RADIATOR

Rust in your cooling system can start damaging your engine long before your radiator blows its top. It will slow up water circulation, which will raise engine temperature, which will raise havoc with engine performance. Don't let it start. A little Texaco Soluble Oil C in your radiator and your troubles are over. Your TAE* can give you the details.

EASY WAY TO AVOID BATTERY DEPOSITS

Don't let battery deposits climb up your cables; you may want to get them off someday. Easiest way to keep this from happening: paint battery terminals with Texaco Rustproof L. One application will keep them deposit-free for months.

HOW TO AVOID THAT FROZEN BOLT

Ever spend six hours fighting a U-bolt that's decided to corrode itself tight? We've seen it happen, and it's an unforgettable experience—especially when we told them they could have ducked all that trouble for the price of a pack of gum. When they let us back in, we showed them how just a dash of Texaco Threadtex could keep their bolt rust-free permanently. Ask your TAE* for a demonstration.

*TEXACO AUTOMOTIVE ENGINEERS

Every month or so we'll bring you a batch of "sleepers"—little angles, so easy to overlook, where big savings in time and money can be made. But month in, month out, your local Texaco Automotive Engineer is the best source of money-saving lubrication ideas. Don't forget that "lubrication is a major factor in cost control." Texaco Inc., 135 East 42nd Street, New York 17, N. Y.

TUNE IN: TEXACO HUNTLEY-BRINKLEY REPORT, MON-FRI.—NBC-TV

TEXACO

Throughout the United States
Canada • Latin America • West Africa

Enter 1290 on Reader Card

NEW LITERATURE

(Continued from page 134)

Scraper, bottom-dump wagon

INTERNATIONAL HARVESTER CO. has released a 36-page catalog detailing its new Model 495 Payscraper and Model 496 Paywagon. The big scraper (34 cu. yd. heaped) has 375 hp., more per struck yard than any same-size unit. Tapered design of the bowl causes dirt to boil toward the center, filling corners and eliminating voids.

The 495 Paywagon has more horsepower per struck yard and less weight per horsepower than comparable wagons, IH states. The 40.5-cu. yd. heaped wagon also features positive controlled bottom dumping, permitting windrowing to a few inches, or over 5 ft.

Enter 613 on Reader Card

Drill steel

ATLAS COPCO EASTERN is distributing a data sheet on its 1½-in. extension drill-steel equipment. Leaflet E-431 gives dimensions and tells the advantages of the rope-thread design of the steel.

Enter 614 on Reader Card

Motor-control digest

ALLIS-CHALMERS MFG. CO., Milwaukee 1, Wis., has released a 162-page booklet titled "Allis-Chalmers Motor Control," which gives descriptions, prices, technical and engineering data on the firm's full line of motor controls. A quick reference selector guide at the front of the digest makes it easy to find any starter, controller or pilot device in the book. The digest is available on request on company letterhead from Allis-Chalmers.

Power shift tractor

CATERPILLAR TRACTOR CO. has released "Power Shift Transmission," form 33403, describing an industry first, a single-stick unit which combines the best features of both direct drive and torque converter. Available in both the D8 and D9 tractors, the Power Shift coordinates a power train consisting of engine, two sets of planetary gears and torque converter.

Enter 615 on Reader Card

Shovel replacement parts

KENSINGTON STEEL, Division of Poor & Co., has released a brochure describing its line of manganese steel, wear-resistant shovel parts. Crawler treads, bucket teeth, drive sprockets, idlers and rollers are included. Most failures of parts such as these are due to inadequate steel or design, and the Kensington line has been planned to improve the parts in both areas, the brochure states.

Enter 616 on Reader Card

Sand and gravel plants

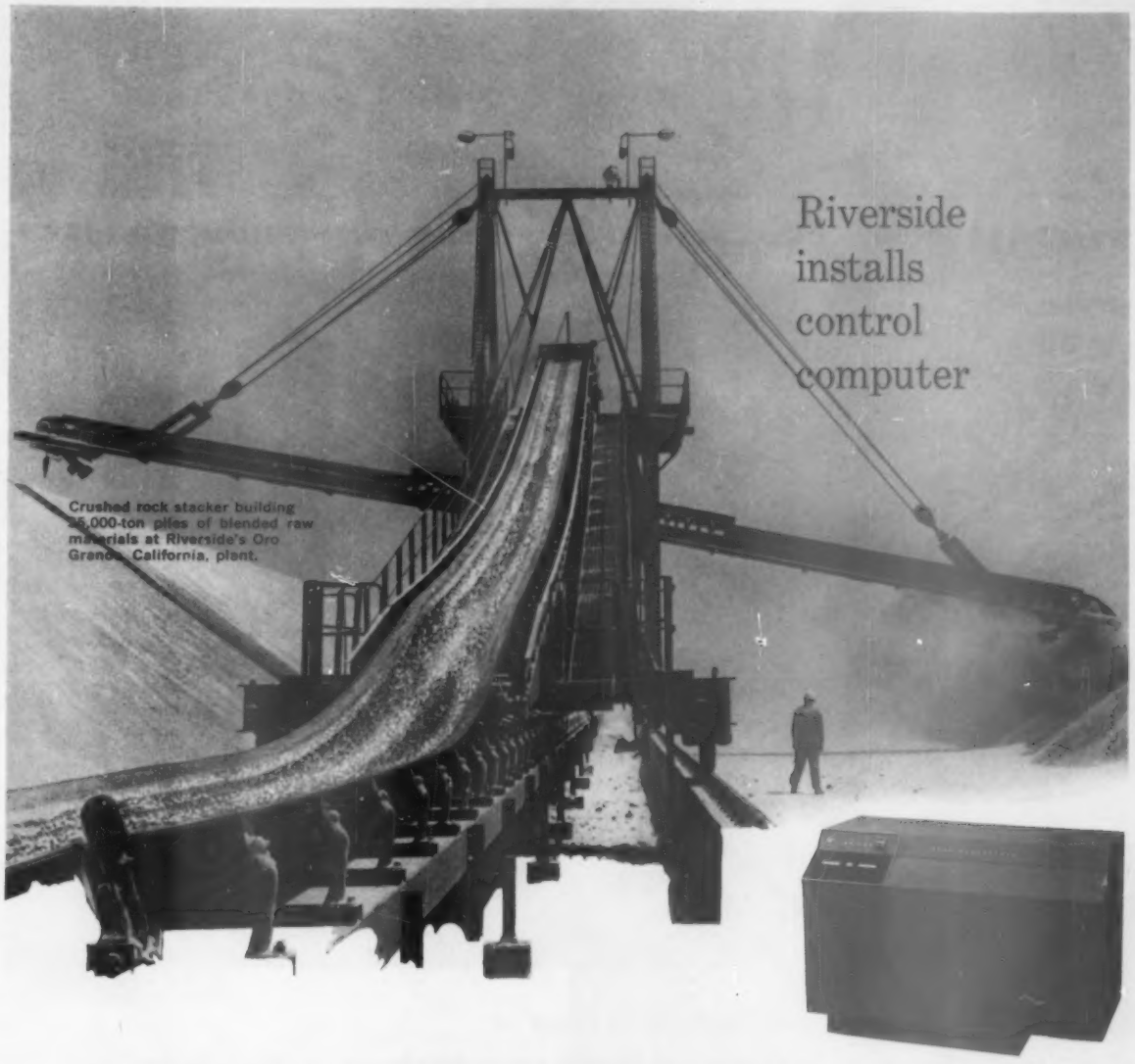
UNIVERSAL ROAD MACHINERY CO., Rubert M. Gay Division, has released a brochure titled "Reliance Heavy-Duty Equipment for Sand and Gravel Plants." Units for scrubbing, washing, crushing and classifying sand and gravel are described. Rotary screens, sand drags, belt conveyors, bucket elevators and jaw crushers are included.

Enter 617 on Reader Card

Conserving natural resources

CHAMBER OF COMMERCE of the United States is distributing "Conservation and Use of Natural Resources," a 54-page booklet giving Chamber policies. It includes sections on water resources and mining. Single copies are free.

Enter 618 on Reader Card



RW-300 DIGITAL CONTROL COMPUTER

to automate cement manufacturing

Riverside Cement Company, Division of American Cement Corporation, a leader in the use of advanced equipment and techniques, has installed an RW-300 Digital Control Computer to guide the blending of raw materials, to collect and analyze data from rotary kilns, and—ultimately—to control the kilns. Continuing more than two years of joint effort, engineers from Riverside and Thompson-Ramo-Wooldridge Products are now developing the mathematical model required for closed-loop control of the kilns. They expect computer control of cement manufacturing to increase plant capacity, reduce operating costs, and improve quality control.

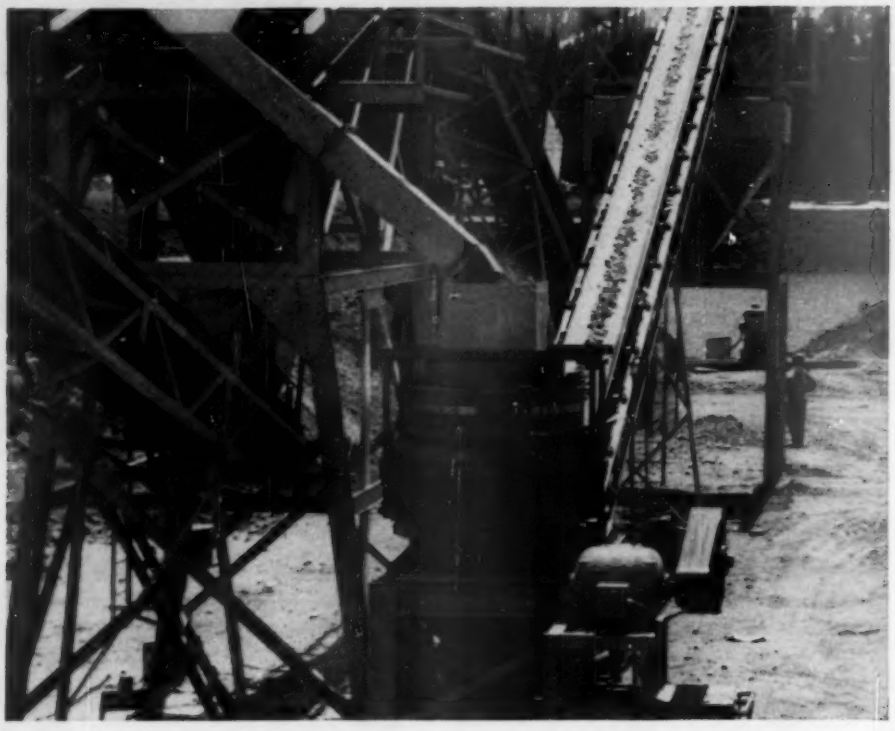
For further information, call or write: Mr. Raymond E. Jacobson, Director of Marketing, The Thompson-Ramo-Wooldridge Products Company, 202 North Canon Drive, Beverly Hills, California, BRadshaw 2-8892.

THE THOMPSON-RAMO-WOOLDRIDGE PRODUCTS COMPANY

a division of ***Thompson Ramo Wooldridge Inc.***

Enter 1274 on Reader Card

SYMONS® CONE CRUSHER AIDS WATER DIVERSION PROJECT



. . . produces over 100,000 tons of granite gravel with original crushing members

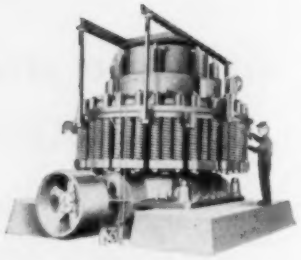
Shown "on location" in scenic Colorado, this 3-ft. Symons Standard Cone Crusher is doing an outstanding job of producing aggregate for a 23-mile long tunnel to divert some 500 million gpd of western slope water out of the Blue River to the eastern slope of the Continental Divide.

Operated by Blue River Constructors, in a crushing plant designed by Brown and Root, Inc. of Houston, this sturdy crusher has produced more than 100,000 tons of tough granite gravel, with the original crushing members.

This is another good example of the dependable performance that contractors and producers have learned to expect from Symons Cone Crushers, in both stationary and portable service.

Write for literature.

NORDBERG MFG. CO., Milwaukee 1, Wisconsin



SYMONS® CONE CRUSHERS

. . . The machines that revolutionized crushing practice . . . are built in a wide range of sizes, for capacities to over 900 tons per hour. Write for descriptive literature.

PROMINENT CONTRACTOR HAS REGRETS

WISHES HE HAD

THOMAS PUMPS

on ALL his dredges!

MERRIWETHER CONSTRUCTION COMPANY

General Contractors

MOBILE, ALABAMA
October 13, 1959

Thomas Foundries, Inc.
P. O. Box 1111
Birmingham 1, Alabama

Gentlemen:

Our dredge, "The Oliver Douglas", has completed the big dredging job awarded us in 1958 for which it was originally built. In building this dredge, we wanted the best equipment it was possible to obtain because we realized that it was a tough job as well as a big one.

Our 16" Thomas Pump enabled us to complete this job without delay and is ready for another big job with its' original parts. The pump proved to be a compliment to our judgement in making the selection.

We would also like to express our appreciation for the cooperation of your representatives for assisting us whenever requested, both on and off the job.

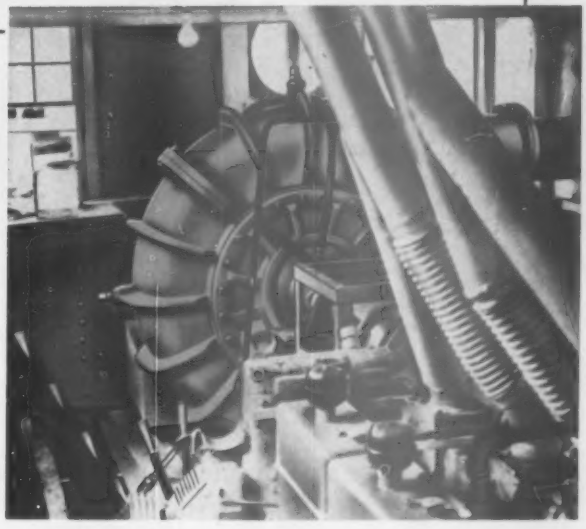
We regret our other dredges are not equipped with Thomas Pumps at the present time, but we assure you that it will not be long before they will be. Thank you for your past favors, we are

Yours very truly,

Merriwether Construction Co.

By Oliver Douglas

Merriwether Construction Company, Mobile, Alabama, an outstanding operator, after a years experience on a "big tough job" says "THE THOMAS PUMP PROVED TO BE A COMPLIMENT TO OUR JUDGMENT". Their big regret now is that all their dredges are not equipped with Thomas Pumps.



Interior view of dredge "Oliver Douglas" showing installation of Thomas Pump discussed in letter above.

This Series NOL Thomas DURABLE Dredge Pump, 18" suction and 16" top horizontal discharge, was installed on the dredge "Oliver Douglas" in 1958. Driven by diesel engines aggregating 800 horsepower, this pump completed the above job without delay, without repairs and new parts, and is now ready for another job.

Unique Thomas design, enabling the use of GENUINE, Dependable Thomas Ni-Hard, makes such performance possible. This design and modern material produces extra long life as well as high initial and sustained efficiency.

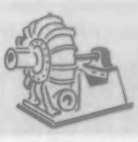
This performance record, backed up by engineering service and cooperation from the Thomas Organization, causes Merriwether to state "WE ASSURE YOU IT WILL NOT BE LONG BEFORE OUR OTHER DREDGES ARE EQUIPPED WITH THOMAS PUMPS."

"YOU CANNOT BUY AT ANY PRICE A MORE DURABLE PUMP FOR DREDGING— YOU CANNOT BUY ANOTHER PUMP THAT WILL MAKE YOU AS MUCH MONEY."

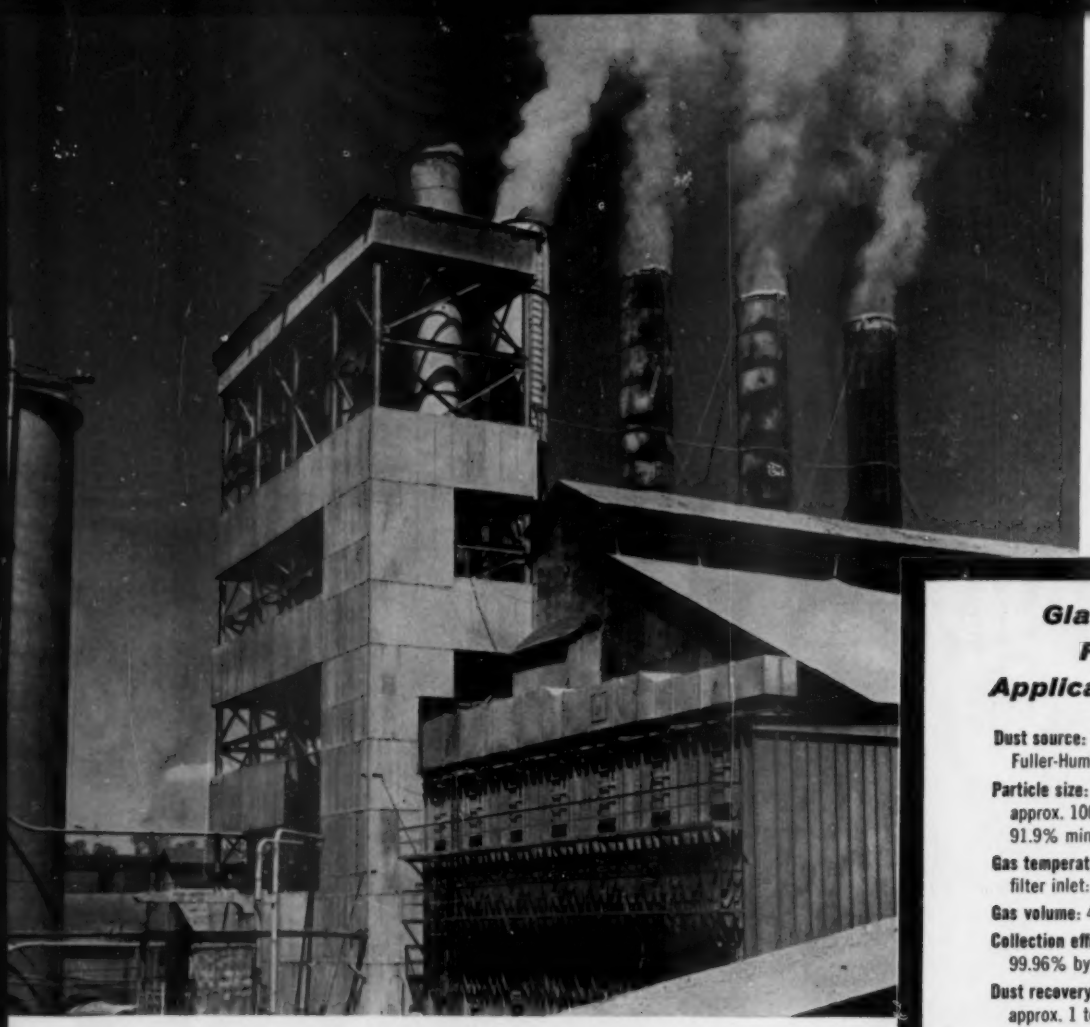
(Thomas Pumps available in sizes 6" through 16")

THOMAS FOUNDRIES Inc.

P. O. Box 1111, Birmingham, Alabama



Enter 1291 on Reader Card



Glass-Bag Filter Application Data:

Dust source: cement kiln with Fuller-Humbolt preheater

Particle size: approx. 100% minus 10 microns 91.9% minus 5 microns

Gas temperature: filter inlet: 570-600° F.

Gas volume: 42,000 cfm

Collection efficiency: 99.96% by weight

Dust recovery rate: approx. 1 ton/hour

Filter size: 7 compartments, 48 fiber glass bags per compartment

Bag cleaning method: SONOCLEAN

Dracco Glass-Bag Filter stops air pollution

The unretouched photograph shows the kiln stacks at an eastern cement plant. *All five kilns are operating!* One stack is clean because a Dracco Glass-Bag Filter is removing all visible dust from the hot kiln exhaust gas.

Results like this have made Dracco Glass-Bag Filters industry's most effective weapon against air pollution.

New performance standard

Previously the hot kiln gases would have made this an "impossible" job for a cloth bag collector. But fiber glass cloth filters, pioneered by Dracco, can collect hot, corrosive dust and fumes to 600° F. at virtually 100% efficiency.

This radically better dust collector is now available to solve the toughest air pollution problems: cement kilns, calciners, metallurgical furnaces, power boilers, chemical processes, cupolas, steam micronizers, carbon black production.

Exclusive advanced design

Dracco Glass-Bag Filters are engineered systems of modular design which operate automatically and incorporate exclusive means of cleaning filter bags. The patented SONOCLEAN unit utilizes sonics to remove all dust without cloth wear or fracture. Alternately, for light flocculent dust, the patented SWING-CLEAN mechanism uses gentle motion to dislodge difficult dusts. Both SONOCLEAN and SWING-CLEAN assure long bag life which in some cases has exceeded two years.

For further information on Glass-Bag Filters, today's most advanced equipment for air pollution or hot dust problems, contact: Dracco Division of Fuller Co., Harvard Ave. and East 116th Street, Cleveland 5, Ohio.

DRACCO *airstream* conveyors
dust control equipment

FULLER COMPANY PIONEERS

NEW PATENTS

by OLIVER S. NORTH

Miscellaneous

2,900,179—In the calcining or sintering of **lime, dolomite, magnesite, portland cement** raw mixtures, batches used in production of **expanded clay,** etc., the material is heated on a perforated trough which is vibrated so as to cause it to progress through the heat zone. Formation of channels in the material, with resultant uneven burning, is prevented. (Patent issued to O. Kaufmann)

2,901,368—Use of **diatomite,** ground **marble** and **silica sand** in a cementitious mix for use as plaster, stucco, brick mortar, caulking material, etc. (to W. J. Newell and T. W. Lewis; assigned to Waterproofing Materials, Inc.)

2,901,456—Use of **asbestos** and mullite or calcined **kyanite, sillimanite, andalusite, dumortierite** or **topaz** in a composition brake shoe for the braking of railway equipment. (to R. E. Spokes and J. B. Littlefield; assigned to American Brake Shoe Co.)

Canadian 580,349 and 580,535—Mill and process for fluid energy grinding of moderately soft minerals, such as **barite, clay, gypsum, marl, oystershell** and **talc.** The ore is slurried with water or other vaporizable liquid, and the slurry heated in a tubular heating zone at high velocity. (to duB. Eastman, F. E. Guptill, Jr., and L. T. Work; assigned to Texaco Development Corp.)

Canadian 581,553—Method and apparatus for production of finely divided mineral concentrate by fluid grinding. An ore-water slurry is passed through a conduit and heated to vaporize the water. The resulting vapor-entrained solids are passed at high velocity through another portion of the conduit, where the ore particles are disintegrated into mineral-rich and mineral-poor fines. Nonmetallic ores that may be advantageously processed include **kyanite, mica, andalusite, brucite, feldspar, fluorspar** and **phosphate rock.** (to P. L. Paull; assigned to Texaco Development Corp.)

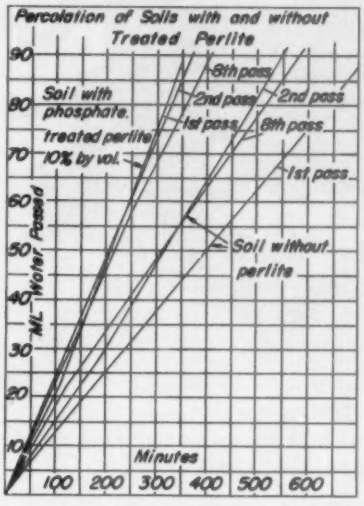


Diagram data of Patent No. 2,904,424 shows graphically the ability of perlite to "lighten" soils, i.e., make them more porous and, hence, water-permeable.

Perlite

U. S. 2,904,424—In the production of a carrier-borne fertilizer having both immediate and prolonged fertilizing characteristics, crude crushed **perlite** ore is mixed with a suitable plant nutrient in water-soluble salt form, and the mixture heated to cause expansion of the perlite. This material is admixed with an additional plant nutrient and then crushed to pass 20 mesh. In use, the second nutrient is released to plants relatively rapidly, while the first nutrient is released gradually over a long period of time. (to E. P. Chapman, Jr., and J. A. Wood; assigned to Peerless Oil & Gas Co.)

(Continued on page 142)

*Copies of United States patents are available at a cost of 25 cents each (photostat copies of foreign patents at 30 cents per page) from The Commissioner of Patents, Washington 25, D.C. For convenience, coupons, each good for one copy of any patent, may be purchased from that official at the rate of $5.00 per 20-coupon pad or $25.00 per 100-coupon pad.

NEW PATENTS

(Continued from page 141)

Lime

2,894,820—Method of producing a highly plastic **lime** for use as finish coat plaster or brick mortar. Particles in the 0.5 to 5 micron range are agglomerated and then comminuted to pass a 44 micron screen. The pulverized material is cut at about the 5 micron point and the finer fraction rejected. The 5 to 44 micron material then is pulverized to produce the desired agglomerated lime hydrate having an Emley plasticity index value well in excess of 200. (to M. A. Rikard, E. A. Bartlett and R. B. Coleman, Jr. Assigned to American-Marietta Company.)

Phosphate rock

U. S. 2,905,322—Method and apparatus for facilitating the separation of reagentized mixtures, e.g., reagent-treated ores of **phosphate rock** and **sylvinite** and like potash ores. (to H. B. Cannon)

U. S. 2,905,526—In the recovery of mineral values from **phosphate rock,** the ore is mixed with lime, and the mixture digested in sodium hydroxide or the like, and the solids filtered off. The aluminate solution is treated to recover aluminum. The residue, enriched in phosphorous and uranium, is digested in sulfuric acid and further processed by known methods for recovery of values. (to R. F. McCullough; assigned to U. S. Atomic Energy Commission)

British 816,368—Improved filtering mechanism especially adapted to the filtration of slurries handled during the acid digestion of **phosphate rock.** (Assigned to Olin Mathieson Chemical Corp., July 8, 1959)

Aggregates

U. S. 2,903,778—Use of **expanded slate** in a refractory concrete utilized in patching rotary kiln linings without waiting for the kiln to cool. In place, the patch has high resistance to abrasion. (to R. F. Gibson and A. F. Old; assigned to Southern Lightweight Aggregate Corp.)

U. S. 2,906,402—In an apparatus for continuously draining wet **sand,** a rotatable worm operated in a hollow container having a porous bottom and enclosed in an outer perforated tube, the space between being filled with a filtration material, such as mineral wool. Suction is maintained in the inner tube. The water is extracted as the sand is conveyed along a belt in contact with the inner tube. (to D. Blankevoort; assigned to D. Blankevoort & Zoon N.V.)

U. S. 2,904,425—To produce a high-quality lime-slag fertilizer, moist **blast-furnace slag** is dried by adding thereto, e.g., on a slag dump, unslaked **lime.** When dry, the treated slag is ground to fine particle size. (to C. Kippe; assigned to Paul Tobeler, d.b.a. Trans-Oceanic)

Britsh 816,132—In a method for producing cementitious pastes of improved fineness, foamed **blast-furnace slag** is wet ground, and the slurry activated in its wet form by adding caustic soda, portland cement or other catalyst effective to set the paste. (to M. Gallai-Hatchard, July 8, 1959)

Vermiculite

Canadian 578,960—In a process for making an improved exfoliated **vermiculite** soil conditioner, the vermiculite particles are wetted and treated with a small amount of water-soluble polyacrylate. (to G. E. Ziegler; assigned to Zonolite Co., July 7, 1959)

Today...the cry is "CLEAN IT UP"

DO IT WITH SECO VIBRATING SCREENS

Shown here is a SECO TWIN BEARING screen photographed at Jackson Pike Sand and Gravel Co. . . . delivering the clean, accurately sized product their customers demand.

Today, the cry is "clean it up" and that's what good operators are doing . . . to get and hold their share of the aggregate business . . . how about you . . . is your plant ready? Don't put up with obsolete equipment that can't possibly do today's job. Don't chance losing business and profits because your product can't make the grade . . . today's specs are stiff . . . tomorrow's promise to be stiffer. You can't afford not to have the best screens in your plant . . . that means SECO SCREENS. Let us show you how to "clean it up" and make profits. There's an exactly right SECO TWIN BEARING or 4-BEARING SCREEN to handle your requirements . . . from scalping to final sizing.

Write, wire or phone

SCREEN EQUIPMENT CO., INC.

BUFFALO 25, NEW YORK

SECO

TRUE CIRCULAR ACTION

VIBRATING SCREENS

Enter 1260 on Reader Card

!!!!

NSGA
NATIONAL SAND AND GRAVEL ASSOCIATION
44th ANNUAL CONVENTION

NATIONAL READY MIXED NRMCA CONCRETE ASSOCIATION
30th ANNUAL CONVENTION

Biennial Show

CHICAGO • FEBRUARY 15-19, 1960

- **ONE SHOW AT TWO LOCATIONS:** Conrad Hilton and the Coliseum. (Free, fast 2-way bus service between.)
- **ACRES OF NEW IDEAS** to benefit your business — the two years' progress of your industry.
- **SHOW DAYS:** Monday, Tuesday, Wednesday, Thursday morning.
- **CONVENTION DAYS:** Wednesday, Thursday, Friday.
- **GIVES YOU 2** full Show days free from Convention meetings.
- **ALL REGISTRATIONS** in Exposition Hall Lobby of Conrad Hilton, starting Friday, February 12. Registration and Show admission free to *producers and users* of sand, gravel and ready mixed concrete.

"My Boss Read the Specs with Tears in His Eyes"

He looked like he'd lost his best friend — money.

"Goodbye contract," he said quietly. "We just can't hope to meet these government specifications for aggregate."

"Yeah, it's pretty hopeless with our set-up. Of course, if we had a hydraulic classifier — " (I was kidding.)

"You're out of your mind. Around here water costs more than sand."

"Well how about an air separator, like Sturtevant makes?" I shot back. "Pete's brother runs a pit at Rapid City and says they clean sand without water. By de-dusting it."

He was skeptical. "Aren't Sturtevants for cement?"

I nodded. "They are, but you see quite a few in aggregates, too, nowadays. Might be worth a try."

The Boss smiled for the first time that morning. "What the heck are you waiting for? Get 'em on the phone and let's see what they can do."

So we got the contract, thanks to the 12 ft. Sturtevant we now use for de-dusting and pre-classification. It's a beaut. Gives good service outdoors the year round, with no protection except for the motor housing.

If you're in this business, Brother, it might pay you to have a good long look at what a Sturtevant can do for tight aggregate specifications.

Sturtevant Air Separators classify production loads up to 150 tph by exact control of air currents and centrifugal force. Simple, quick adjustments make possible the selection (or rejection) of particles in the 30 to 400 mesh range. Nine standard models available, varying in size from 3′ to 18′.

Learn how a Sturtevant Air Separator can help your aggregates production. Write today describing your needs. Address: Sturtevant Mill Co., 102 Clayton St., Boston 22, Mass.

STURTEVANT AIR SEPARATORS CLASSIFY SAND WITHOUT WATER

PRODUCING CLEAN SAND, the Sturtevant acts as a de-duster by removing fine mesh particles from the throughput. Particularly valuable where water is limited.

EASING SCREEN LOADS, the Sturtevant rejects unwanted fines and circuits coarser sizes to screens for grading. By this pre-classification, the possibility of blinding screens with fines is minimized and output considerably increased. Also, excessive dust problems are eliminated.

WHEN BLENDING IS NECESSARY, the Sturtevant selects fines from the crushing operation. This stockpiled product then can be used in the blending operation to overcome fineness modulus deficiencies.

GRINDERS
CRUSHERS
PULVERIZERS
MICRON-GRINDERS

STURTEVANT MILL CO.

Dry Processing Equipment

MIXERS
BLENDERS
ELEVATORS
AIR SEPARATORS

The "OPEN-DOOR" to *lower* operating costs over *more* years

Enter 1265 on Reader Card

For an old-fashioned winter — this new-fashioned Primacord

You can get tight knots and hook-ups even with stiff fingers when the weather's *cold!* Ensign-Bickford's new LO-TEMP Primacord is very flexible, easy to handle, and knots securely at *all* temperatures — even down to *minus* 40°F.!

LO-TEMP can be used for in-hole priming wherever conditions do *not* call for our more rugged types of Primacord. Use it as the trunkline for *all* hook-ups. Detonate with fuse and cap or electric blasting cap, side-taped about eight inches in from the end of the trunkline, and with the business end of the cap pointing in the direction of the blast.

Like all types of Primacord, LO-TEMP is very insensitive to initiation by shock, friction, sparks or electricity. When initiated with a blasting cap, it explodes at a velocity of 21,000 feet per second and has the initiating energy of a blasting cap along its entire length.

For connecting trunklines and downlines

THE ENSIGN-BICKFORD COMPANY

Simsbury, Connecticut — Since 1836

L-2

Enter 1302 on Reader Card

READER-SERVICE CARD

RP-12-59

ROCK PRODUCTS
79 W. Monroe St.

DECEMBER, 1959
Chicago 3, Illinois

Cannot be serviced after February 1, 1960 postmark.

Please print or type

Name _____ Position _____

Company (In Full) _____

Company Address _____ City _____ Zone _____ State _____

Send information on items identified by key numbers beside or below items of interest to you. List your choice in numerical order. Limit 10 per card.

(1) ..... (2) ..... (3) ..... (4) ..... (5) .....

(6) ..... (7) ..... (8) ..... (9) ..... (10) .....

IF NO KEY NUMBER, USE COMPANY NAME

BUSINESS REPLY CARD
No Postage Stamp Necessary If Mailed in the United States

FIRST CLASS
PERMIT NO. 1417
CHICAGO, ILL.

– POSTAGE WILL BE PAID BY –

ROCK PRODUCTS
79 WEST MONROE ST.
CHICAGO 3, ILL.

MONEY-MAKING IDEAS FOR YOU - - - FREE

HOW TO USE THIS SERVICE

1. **Advertised Products**
2. **New Machinery**
3. **New Literature**

There is a wealth of valuable information in the manufacturers' booklets offered in this issue. For your convenience, each advertisement, each new machinery and new literature item has been given a key number. Simply fill in the proper key number in the appropriate space on the card above and send it to us. We'll do the rest.

BUSINESS REPLY CARD
No Postage Stamp Necessary If Mailed in the United States

FIRST CLASS
PERMIT NO. 1417
CHICAGO, ILL.

– POSTAGE WILL BE PAID BY –

ROCK PRODUCTS
79 WEST MONROE ST.
CHICAGO 3, ILL.

READER-SERVICE CARD

RP-12-59

ROCK PRODUCTS
79 W. Monroe St.

DECEMBER, 1959
Chicago 3, Illinois

Cannot be serviced after February 1, 1960 postmark.

Please print or type

Name_____ Position_____

Company (In Full)_____

Company Address_____ City_____ Zone____ State_____

Send information on items identified by key numbers beside or below items of interest to you. List your choice in numerical order. Limit 10 per card.

(1) ..... (2) ..... (3) ..... (4) ..... (5) .....

(6) ..... (7) ..... (8) ..... (9) ..... (10) .....

IF NO KEY NUMBER, USE COMPANY NAME

MONEY-MAKING IDEAS FOR YOU - - - FREE

HOW TO USE THIS SERVICE

1. **Advertised Products**
2. **New Machinery**
3. **New Literature**

There is a wealth of valuable information in the manufacturers' booklets offered in this issue. For your convenience, each advertisement, each new machinery and new literature item has been given a key number. Simply fill in the proper key number in the appropriate space on the card above and send it to us. We'll do the rest.

JAW CRUSHERS

Size Range	Rated Tons Per Hour		Required Horsepower		Tons Output Per Horsepower		
	Lippmann Grizzly-King	Avg. of Competition*	Lippmann Grizzly-King	Avg. of Competition*	Lippmann Grizzly-King	Avg. of Competition	Lippmann "Bonus"
18 x 36	132	91	62½	67½	2.1	1.4	50%
24 x 36	200	141	87½	94	2.3	1.5	53%
30 x 42	300	212	115	133	2.6	1.6	62%
42 x 48	580	456	200	200	2.9	2.3	26%

*Figures from latest available specifications of Smith, Universal, Lima, Diamond, Iowa, Pioneer, Rogers, and Gruendler, wherever same or comparable sizes exist, and at equivalent discharge settings. To simplify chart, median figures are used where specifications are given in a minimum-to-maximum range.

facts beat claims...

and these published facts — backed by field performance records — put real substance behind Grizzly-King's reputation for lowest-cost-per-ton. Chart shows how Lippmann Grizzly-King gives you up to 41% more rated tonnage capacity... up to 62% higher power-efficiency... than the average of leading competitive machines of same jaw-size rating!

Some reasons: Size for size, Grizzly-King gives you up to 37% more jaw area... 16% longer stroke... low angle of nip, more stored flywheel energy, and extra-heavy-duty shaft and bearing assembly with specially engineered frame for *every* jaw size.

If you've been caught in the squeeze of high operating costs and tough price competition, perhaps *this* is the time to call in your Lippmann representative. Or send for Grizzly-King 12-page bulletin.

LIPPMANN

ENGINEERING WORKS, INC. • Milwaukee 14, Wis.

Jaw, Roll, and Gyratory Crushers • Conveyors • Vibrating Screens • Apron Feeders • Pulverizers • Portable Crushing and Washing Plants • Classifiers • Bins, Hoppers

F-C-9-59

Enter 1281 on Reader Card

mountains into molehills

SCORES AN ENGINEERING TRIUMPH ON THE SALT LAKE CITY PROJECT

Pound for pound, Enka Rayon is your best value in industrial yarn

Specify Enka high-tenacity rayon yarns for industrial rubber products, chafer fabrics, heavy-duty sewing thread and many other vital end-use applications.

Greater strength • More elasticity • Increased heat and humidity resistance • Higher safety factor • More economy • Superior flexibility • Better shock absorbency • Longer service • Less maintenance.

Write for Hewitt-Robins brochure on C/R conveyor belting of high-tenacity rayon and cotton. It gives technical data on strength and other characteristics of belting made with cotton-rayon fabric. Write Hewitt-Robins, Stamford, Conn. Ask for bulletin 12-19A.

ENKA high-tenacity rayon for industry

and fibers for apparel, home and industry, and Tyrex® viscose tire yarn.

Enter 1304 on Reader Card

NEW MACHINERY

For further free information on items identified by key numbers, simply fill out and mail the postage-paid Reader Service Card found elsewhere in this issue.

Explosive mixing plant on wheels checks process costs

MUCH OF THE ECONOMY of bulk fertilizer as an explosive is often lost in wasted materials and labor expense. The cost shows up in reduced rock yield and runaway maintenance on rock processing equipment out of the quarry.

This manufacturer has helped to solve the problem by offering an ammonium nitrate truck which transports the explosive to the quarry in bulk, meters the oil addition and discharges the mixed explosive into the blast hole.

A parabolic tank with either 4-ft. long or 2-ft. long compartments holds the prilled ammonium nitrate. Each compartment is unloaded with a 9-in. screw conveyor which meters the fertilizer into the airstream of a blower driven by an auxiliary engine. Oil is sprayed into the stream of material as it flows into the discharge hose leading to the blasthole.

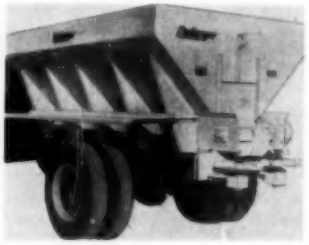
Enough oil is carried on the truck to treat the whole payload of nitrate with 5 to 6 percent oil. The ratio is controlled by the operator who sets the control valves regulating the oil pump.

This new truck body enables quarry operators to transport ammonium nitrate at bulk fertilizer rates. It permits the user to bring the explosive materials right up to the point of use without trans-shipment, rehandling or storage. At the same time, the amount of explosive used and the oil mix ratio is under the direct control of the blasting foreman. *Baughman Mfg. Co., Jerseyville, Ill.*

Enter 200 on Reader Card

Distributor truck

THIS NEW DISTRIBUTOR TRUCK BODY has incorporated a number of features which make it easy and economical for



rock products producers to deliver and spread agricultural limestone. The challenger line of truck bodies is available in a capicity range from 4.6 to 8.8 cu. yd.

The conveyor and spinner system for each body operates from a power takeoff. In addition, several sizes of conveyor and spinner are available; an 18-in. flight conveyor with single spinner and 24-in. conveyor with double spinners are standard equipment. The entire line has exceptional quality with a low price tag, according to the manufacturer. *Highway Equipment Co., 616 D Ave. N.W., Cedar Rapids, Iowa.*

Enter 201 on Reader Card

New babbited bearings

BABBITED and bronze-bushed bearings are not obsolete in the rock products industry, by any means. In fact, this manufacturer has vastly extended the application of this type of bearing by broadening the size range and bearing capacity in almost all of his lines. Two popular types, gibbed pillow blocks and angle bearings, are now available for 9, 10 and 12-in. diam. shafts.

The series 1400 gibbed pillow blocks are offered for the first time with cast steel housings and bronze bearings. Bronze bushed bearings are obtainable in the angle bearing series 1500 and in the series 1000 solid pillow block group. *Link-Belt Co., Dept. PR, Prudential Plaza, Chicago 1, Ill.*

Enter 202 on Reader Card

Drilling safeguard

"GREATEST INNOVATION in diamond drilling history," is this manufacturer's description of his No-Flo-No-Go drilling device. The drill rig with this protection won't start until water flows across the face of the bit: It stops automatically when the fluid stops.

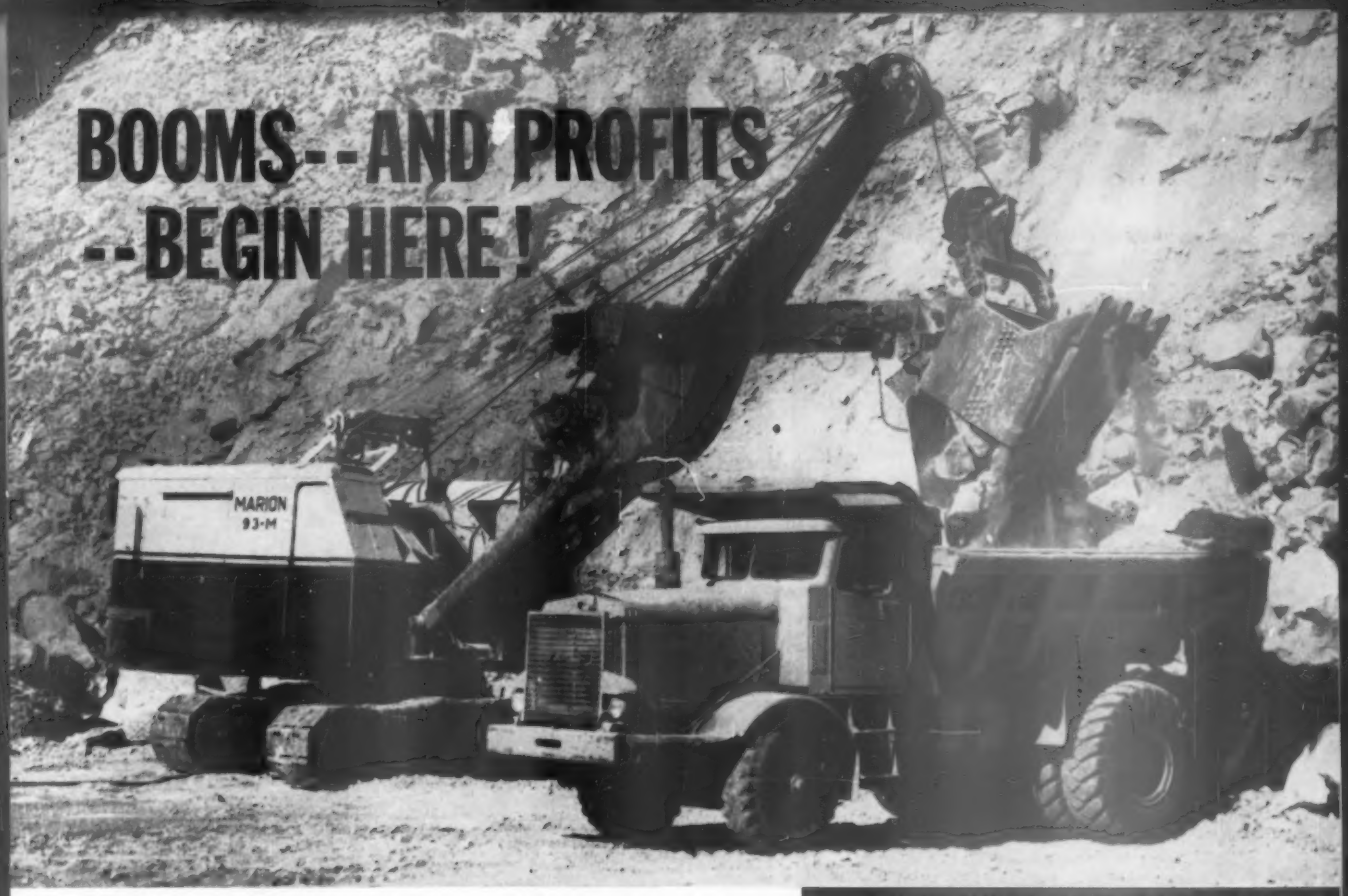
It is now impossible to burn out expensive bits, and the savings in tools and motor damage is often enough to pay for the protective equipment during the first year of operation. The new device is available on the maker's drill rigs as standard equipment, but can be factory-installed as an accessory on other equipment. *Diamond Products, Inc., Elyria, Ohio.*

Enter 203 on Reader Card

(Continued on page 154)

Enter 1292 on Reader Card

BOOMS--AND PROFITS --BEGIN HERE!



A Marion 93-M gulps up 2½ yd. bites of limestone in a California quarry.

There's good reason why more and more Marions are being put to work on those "tight profit" excavating and crane jobs throughout the booming West. Contractors have found that Marions "deliver" . . . whether ripping copper ore from the ground in Colorado, or gently pin-pointing steel girders for a new building in California.

Deep in the black-soiled timberlands of the Pacific Northwest they know about dependable Marions too, for here you'll find these versatile machines daily moving millions of boardfeet of lumber closer to the ultimate consumer. And, Marions can be found on the more menial tasks as well . . . digging sewerage ditches, powering "skull crackers" in rebuilding programs, rehandling coal from barges or performing hundreds of other, similar jobs.

Marions are in business throughout the burgeoning West because they are "profit oriented" machines . . . with the power, speed, versatility and capacity to make the toughest jobs look simple.

You get

MORE *with* **MARION**

MARION POWER SHOVEL COMPANY, MARION, OHIO
A Division of Universal Marion Corporation

A Marion 43-M with a 1-yd. backhoe completes sewerage project in Seattle area.

This versatile 35-M is excavating foundations for a $1,600,000 building project on the coast. It carries a 60-ft. boom and 20-ft. jib.

DISTRIBUTOR MACHINE CHART

MACHINE	Shovel Capacity	AVAILABLE AS .			
		Hoe	Crawler Crane	Truck Crane	Special Crane
35-M	¾	Yes	Yes	Yes	—
43-M	1	Yes	Yes	Yes	—
362	1½	Yes	Yes	—	Yes
93-M	2½	Yes	Yes	—	Yes
101-M	3	—	Yes	—	—
111-M	4	—	Yes	—	—

(Continued from page 152)

Variable speed drive

THIS NEW VARIABLE SPEED DRIVE assembly has a bracket for a separate motor. This gives the operator an opportunity to choose an intermediate drive ratio between motor and variable speed unit to achieve a wide range of output speeds from the unit. Motors with special characteristics, enclosures and speeds can be used.

The compact assembly can meet a wide range of power requirements between ½ and 30 hp. Output speeds can be selected between 1.2 and 4,660 rpm., with speed variation ratios between 2:1 and 10:1. *Sterling Electric Motors, Inc., 5401 Telegraph Road, Los Angeles 22, Calif.*

Enter 204 on Reader Card

Utility tractor

A NEW 54 HP. UTILITY TRACTOR is now available. It was designed particularly to do a wide range of chores with a group of matched attachments. Features of the new tractor include a dual-range transmission, two-stage industrial clutch and power takeoff, power steering and a new, heavy-duty front axle. *Massey-Ferguson Industrial Div., 1000 So. West St., Wichita 13, Kans.*

Enter 205 on Reader Card

Portable pump

A COMPACT, PORTABLE 3-in. suction pump is now available. The Model 3XPN weighs only 395 lb., complete with pneumatic tires and gasoline engine with aluminum cylinder head. Outstanding feature of the new unit is quick removal of the entire suction chamber and liner plate without removing the volute. This permits adjustment, rotation or replacement of the liner in a matter of minutes. With a 4-in. suction hose the unit can deliver 460 gpm. at 10-ft. lift and is self-priming up to 25-ft. suction lift. *The Jaeger Machine Co., 550 W. Spring St., Columbus 16, Ohio*

Enter 206 on Reader Card

Diesel pumps

THIS MANUFACTURER offers a complete line of self-priming and non-priming diesel pumps to the rock products industry. The diesel engine feature gives high fuel economy, low maintenance and compact assembly. The pump itself is available in capacities from 40 to 1,600 gpm. to achieve low cost water handling over a wide range of pumping requirements. *Carver Pump Co., Muscatine, Iowa.*

Enter 207 on Reader Card

Swing-boom drill

A NEW, ALL-PURPOSE blast hole drill offers the quarry operator several new features which add to the ruggedness and flexibility of the machine. The Model ATD-3000 is a crawler-mounted drill. Its low center of gravity makes it highly maneuverable on rough ground. Tracks are equipped with laminated rubber pads to give better ground contact and the tracks are more than 6 ft. long.

Flexibility is achieved with the boom which can swing in a 11-ft. 10-in. arc. More holes can be drilled from a single set-up and greater drill hole spacing is possible, according to the manufacturer. The 4 or 4½-in. drill can be used for low horizontal drilling, angle drilling in any position and for breast hole drilling up to 9½ ft. above ground level.

Other features of the new rig include front and rear controls, rotation controls for forward, neutral and reverse rotation, hydraulic feed extension and built-in air motor for the hydraulic pump and reservoir. *Gardner-Denver Co., Quincy, Ill.*

Enter 208 on Reader Card

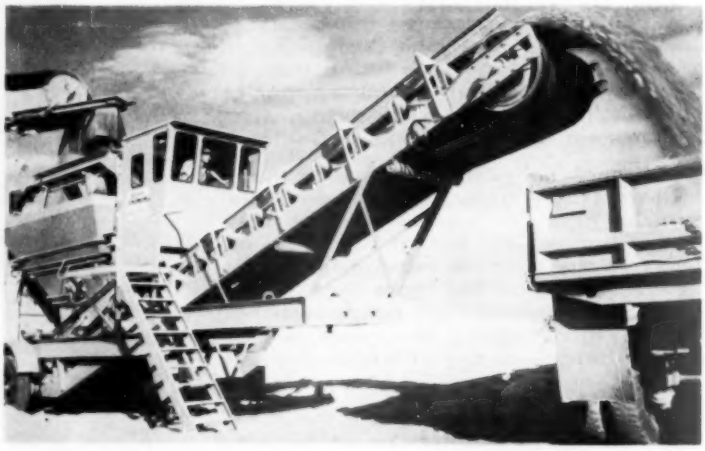
New tractor shovel

HERE'S A NEW TRACTOR SHOVEL with modest capacity, yet with plenty of power, speed and maneuverability. This four-wheel drive, rubber-tired tractor shovel has a carry capacity of 5,000 lb. and has a 90 hp. diesel or gasoline engine.

The new Model H-50 features a highly efficient torque converter, power shift transmission, power steering, pry-out bucket action. *The Frank G. Hough Co., Libertyville, Ill.*

Enter 209 on Reader Card

Portable scales-loader speeds aggregates shipping



A FULLY PORTABLE UNIT to weigh aggregates and to load trucks in the same operation has been developed. Named "Schrock Speed-Weigh," the new machine can weigh and load two 6-ton batches a minute of sand and gravel or crushed stone aggregates.

The complete unit weighs 15 tons. It is mounted on its own trailer and can be transported to the job site at 50-mph. and set up ready for business in less than an hour. The manufacturer expects that the new machine will completely replace the platform scale at aggregates preparation plants and construction sites.

An electronic load cell permits a guaranteed accuracy within ½ of 1 percent; actual operation gives accuracy within 1/10 of 1 percent. Automatic control is possible with electronic weighing components which make a printed record in duplicate of each batch. *Western Conveyor Co., Boise, Idaho.* **Enter 210 on Reader Card**

(Continued on page 156)

TWENTY-TON LOAD aboard trailer fails to bother multiwall sack made with CLUPAK kraft. Patented, built-in stretch absorbs shock as wheels pass completely over. Sack contains 100 pounds of abrasive sand-blasting grit, found difficult to package prior to use of CLUPAK paper multiwalls.

SAVINGS PILE UP when CLUPAK paper multiwalls are used. Flexibility lets them fill better, may cut storage or shipping space up to 25%. Sacks can be palletized higher, easier, because they stack better.

CLUPAK TRADEMARK is your assurance the bag paper meets the most rigid of shipping requirements, even when CLUPAK paper toughness makes possible lower total basis weight. Look for the trademark.

NEW PAPER WITH REVOLUTIONARY "*TOUGHNESS*" CUTS MULTIWALL BREAKAGE...AND COSTS, TOO!

BETTER PERFORMANCE, LOWER COST! CLUPAK Extensible Paper opens a new era in paper . . . makes it virtually a new material, with unlimited applications. For CLUPAK paper has built-in *stretch* or extensibility which lets it absorb the shocks and strains that cause ordinary paper to rip, tear and puncture. The result is a new dimension in paper—*toughness*. In multiwall sacks, CLUPAK paper toughness delivers far better performance . . . often at lower cost, by permitting fewer multiwall plies and a net saving in total basis weight. And CLUPAK paper *flexibility* can mean additional advantages—faster filling, easier handling and stacking.

KEY FACTS FOR BUYERS: CLUPAK kraft is the same as ordinary kraft except that it is stronger, tougher and more flexible. It can be made in many basis weights, and with varying degrees of stretch. Printability, surface friction, porosity and other properties can be controlled as with ordinary paper. Clupak, Inc., does not make paper. It carries on continuous research and development work, and results are made available to all licensees, listed below. **Clupak, Inc., permits use of its trademark only on paper which meets this company's rigid toughness requirements.** Clupak, Inc., 530 Fifth Avenue, New York 36, N. Y.

BE SURE TO LOOK FOR THIS TRADEMARK

EXTENSIBLE
CLUPAK®
PAPER

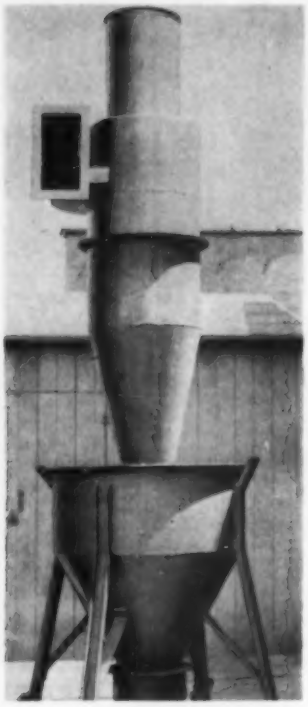
**Clupak, Inc.'s trademark for extensible paper manufactured under its authority.*

Buy CLUPAK paper and products made with CLUPAK paper from:

Albemarle Paper Mfg. Co.
Calcasieu Paper Co.
Canada Paper Co. (Canada)
Crown Zellerbach Corp.
Continental Can Company, Inc.
Dynas Aktiebolag (Sweden)
Hudson Pulp and Paper Corp.
International Paper Co.
St. Lawrence Corp., Ltd. (Canada)
St. Regis Paper Co.
Union Bag-Camp Paper Corp.
West Virginia Pulp and Paper Co.

Enter 1264 on Reader Card

(Continued from page 154)



New dust collector design

HEAVY AND ABRASIVE DUSTS can be handled more efficiently in a newly designed type of involute dust collector. This design permits highly efficient collection of heavy dust loadings.

The new I-C collector can be used in series with the maker's other types of mechanical and electrostatic collectors to achieve remarkable dust collection efficiency. In addition, the involute collectors are available in virtually any size and can be fitted with cemented liners to resist the action of abrasive dusts. *Research-Cottrell, Inc., Bound Brook, N.J.*

Enter 211 on Reader Card

Replacement diesels

A COMPLETELY NEW LINE of high speed diesel engines is available. Designed primarily to replace gasoline engines in light and medium weight trucks, the new engines will certainly have wide applications for other jobs. The new units range in size from 50 to 350 hp. in 3, 4, 6 and 8 cylinder models.

Four of the new engines have fuel injection systems especially designed for the use of almost any fluid hydrocarbon as fuel. No adjustments are necessary to change from one fuel to the other. The design of the firing chamber and fuel spray nozzle makes it possible to operate at high efficiency on any available fuel.

Since the engines were primarily intended for the large potential replacement market, they are light in weight, low in cost and short in length. These characteristics make them suitable to replace gasoline engines in many trucks with a minimum of changes, according to the maker.

These features make the diesel engines suitable for driving other machinery—generators, materials handling equipment and a wide variety of other industrial equipment. *Hercules Motors Corp., 101 Eleventh St., S.E., Canton 2, Ohio.*

Enter 212 on Reader Card

Rust solvent

A NEW RUST SOLVENT with exceptional wetting and penetrating power is now available to the hard-pressed maintenance man in the rock products industry. The maker claims that the new product has superior penetrating power compared to the best known brands of penetrating oils. It can penetrate deeply and quickly into rust-frozen surfaces and joints. At the same time, it lubricates the rusted surfaces to permit them to be disengaged or unscrewed with ease. Known as KPO No. 1, the new solvent is available in pint cans and in bulk containers up to 55 gal. *Keystone Lubricating Co., 3100 No. 21st St., Philadelphia 32, Pa.*

Enter 213 on Reader Card

Conveyor backstop

TO OVERCOME THE HAZARDS when belt conveyors and bucket elevators are stopped under load and reverse direction, this manufacturer offers two types of holdback. One, standard unit is known as the roller type. It is a simple, rugged unit designed to prevent loaded bucket elevators and heavily loaded belt conveyors from reversing when their power supply is cut off. The other, a heavy duty unit, is totally enclosed. It performs the same holdback function as the roller type, with the additional advantage of complete enclosure.

Dust-tight enclosure is particularly important. Conveying equipment in rock products plants often works in damp or dusty atmospheres. Standby or safety equipment can become inoperative if constant inspection and maintenance is neglected. The totally enclosed design of the new holdback prevents the entry of dust and foreign material into its working parts. This assures dependable, maintenance-free operation.

The two types of holdback are available for mounting on head shafts or countershafts in most standard sizes between 1 7/16 and 12-in. diam. *Stephens-Adamson Mfg. Co., Aurora, Illinois.*

Enter 214 on Reader Card

Portable press

THIS NEW PORTABLE PRESS will prove to be ideal for rock products producers who service their own Hendrickson tandems, whatever the make of their heavy-duty trucks. The new machine can remove and install the equalizing beam center and end bushings without removing tire or wheels. Nor is it necessary to remove the entire beam from the truck to service the center bushing which usually needs attention more often than the end bushings.

The new press consists of a frame on casters, a 30-ton hydraulic ram and pump assembly and a set of seven special adapters. The maker claims that this machine is fast, safe and easy to handle and that it will save the truck maintenance man many hours of his time. *Owatonna Tool Co., 496 Cedar St., Owatonna, Minn.*

Enter 215 on Reader Card

No-air tire

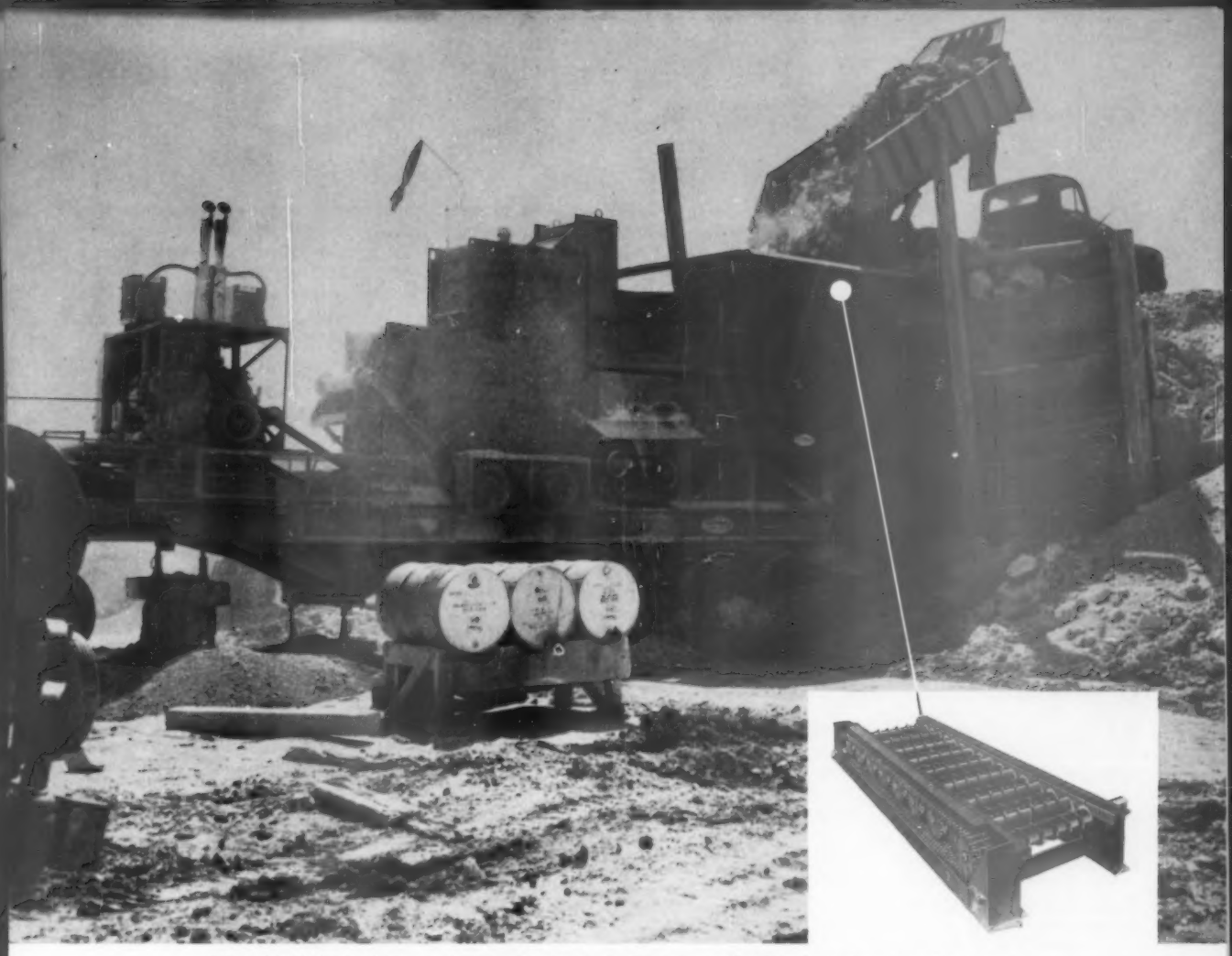
A SOFT, BOUNCE-FREE RIDE is offered to the users of front end loaders, tractors and other equipment when the machines are fitted with these newly developed, non-pneumatic tires.

The tire is assembled of radial laminations of nylon and rubber held together with a steel band and assembled on a manufacturers' standard rim. The laminations permit the tire to ride comfortably over crushed stone, glass, brick and other road hazards without damage. Costly downtime to patch or repair tires is eliminated and the maker claims that the tires often last the lift of the equipment. *Notat Tire Co., 1504 E. 34th St., Chattanooga, Tenn.*

Enter 216 on Reader Card

(Continued on page 158)

Enter 1243 on Reader Card



Universal Wobbler Feeder-Impact Master combination in the Kaser Quarry, Red Oak, Iowa. Kaser, one of the largest producers of aggregate materials in Iowa, uses the plant to produce Type A asphalt crushed rock aggregate.

This Universal plant opened a new profit source for Kaser Quarry

Kaser's Red Oak Quarry is now producing Type "A" asphalt aggregate — a material they were not able to produce until they installed their new Universal Wobbler Feeder-Impact Master.

Type "A" asphalt aggregate calls for clean material. However, the Red Oak quarry-run material contains a substantial percentage of fines and wet clay — normally hard to clean.

In a single operation, the Wobbler Feeder removes the fines and clay — feeds only clean rock to the Impact Master.

Wobbler Feeder Scalps as it feeds

Patented elliptical bars, set in alternate vertical and horizontal positions rotate at a constant speed in the same direction, moving the load forward. A tumbling rocking motion is set up, sifting fines and clay through the spacings between bars — only clean oversize reaches the crusher.

In Kaser's operation, material passing through the Wobbler bars is further processed giving 100% useable products.

The exclusive Universal Wobbler Feeder has been job-proved throughout the world in almost every kind of material.

It's a brute for punishment — the bigger the load the better it works — operates free of noise, vibration or stress. It's easy to install, requires little head room — provides high capacity with low horsepower. There's a size for every need — ask your Universal Distributor to show you how the Wobbler Feeder has solved hundreds of feeding problems . . . and how it can be a profit producer for you.

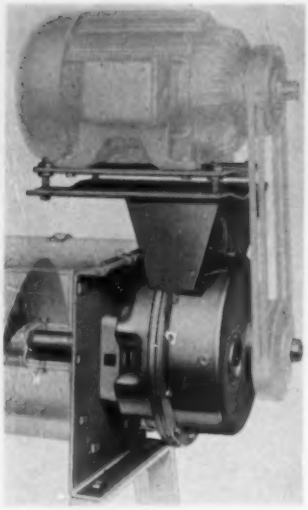
PETTIBONE UNIVERSAL
In Cedar Rapids Since 1906

UNIVERSAL ENGINEERING CORPORATION

617 C Avenue N.W., Cedar Rapids, Iowa

Subsidiary of Pettibone Mulliken Corporation, 4700 W. Division Street, Chicago 51, Illinois

(Continued from page 156)



Screw conveyor drive

A SHAFT-MOUNTED SPEED REDUCER has been developed especially for use on screw conveyors. The sizes and ratios of the new reducer were designed after a careful study of the particular requirements for screw conveyor application.

Six sizes cover power needs from ½ to 30 hp. Each has four speed reduction ratios: 4:1, 9:1, 14:1 and 24:1, assuring a wide range of output speeds for correct conveying speed.

Basic unit is the reducer with extended drive shaft and seal gland. This can be combined with any standard trough end from 6 to 20-in. and motor support bracket to make a complete screw conveyor drive package.

Screw conveyor end thrust in either direction is adsorbed by tapered roller bearings in the reducer. The reducer can be removed from the drive shaft without disturbing the trough end. *The Falk Corp., Milwaukee 1, Wisc.*

Enter 217 on Reader Card

Induction motors

ONE OF THE MOST complete lines of large induction motors is now available in ratings from 150 to 2,000 hp. It is intended for industrial applications requiring constant speed ac. motors at either 1,800 or 3,600 rpm.

Special design emphasis was placed on ventilation to achieve maximum cooling effect and minimum noise levels. A separate-motor pressure lubrication system is standard on 3,600 rpm., 1,000 hp. motors and larger but is optional on smaller motors in the line. This system assures adequate oil pressure before starting the motor and maintains pressure during coast-down.

Several types and styles of bearings are available to meet the requirements of the particular application—speed, overhung load and torque. Three-bearing motors are available which include extended shaft and outboard bearing. *Louis Allis Co., Dept. P, Milwaukee 1, Wis.*

Enter 218 on Reader Card

Bronze-bushed takeups

THE DEVELOPMENT OF THREE complete lines of bronze-bushed takeup bearings for moderate service has greatly extended the usefulness of these takeups. Two of the lines have pressed steel frames, designed especially for mounting the takeups on structural steel supports. The addition of bronze bearings brings the capacity of the bearing closer to the structural strength of the supporting frame and permits the takeup to support heavier loads.

The third series, N 3000, is particularly adaptable for use on conveyors with light to moderate loads and on special equipment where takeup space is limited. The use of bronze bearings permits this takeup to be used for heavier applications. *Link-Belt Co., Dept. PR, Prudential Plaza, Chicago 1, Illinois.*

Enter 219 on Reader Card

Portable instruments

A COMPLETELY NEW LINE of portable instruments for testing, calibration or laboratory use has been developed. The E-line was designed to meet the needs of industry and resarch for portable, sensitive instruments.

A portable millivolt potentiometer is designed for routine, in-place checking of production instruments—thermocouples, controllers and recorders—as well as for calibration. A single-range and double-range temperature potentiometer are included in the line and are said to include design innovations not available in conventional temperature indicators.

Included in the line is a portable volt potentiometer, known as the "Baby K-3," a guarded dc. null detector, and two new galvanometers. These galvanometers have been greatly reduced in weight but offer two to four times greater sensitivity than conventional units. At the same time, they can operate horizontally, vertically or tilted. *Leeds & Northrup Co., 4934 Stenton Ave., Philadelphia 44, Pa.*

Enter 220 on Reader Card

El Paso OK's operation of rock crushing plant

THE EL PASO, TEXAS, Zoning Board of Adjustment issued a 2-year temporary permit to the Borsberry Construction Co. to operate a rock crushing plant within the city, denying protests of several groups who contended it would be a nuisance to the area.

Under terms of the permit, the plant will be operated on 39 acres of land in Northwest El Paso. The board reserved the right to reverse the judgment at any time if the plant is found to be a detriment to the public convenience and welfare. Also, the company must leave the land graded and suitable for building sites upon completion of the operation.

Enter 221 on Reader Card

Pittsburgh Coke builds bulk cement terminal

PITTSBURGH COKE AND CHEMICAL Co., Green Bag Cement Division, Pittsburgh, Pa., is constructing a $500,000 cement distribution terminal near Marietta, Ohio. Storage capacity will be 25,000 bbl. Besides three silos, the terminal will include barge unloading, truck loading and weighing facilities and docks.

Enter 222 on Reader Card

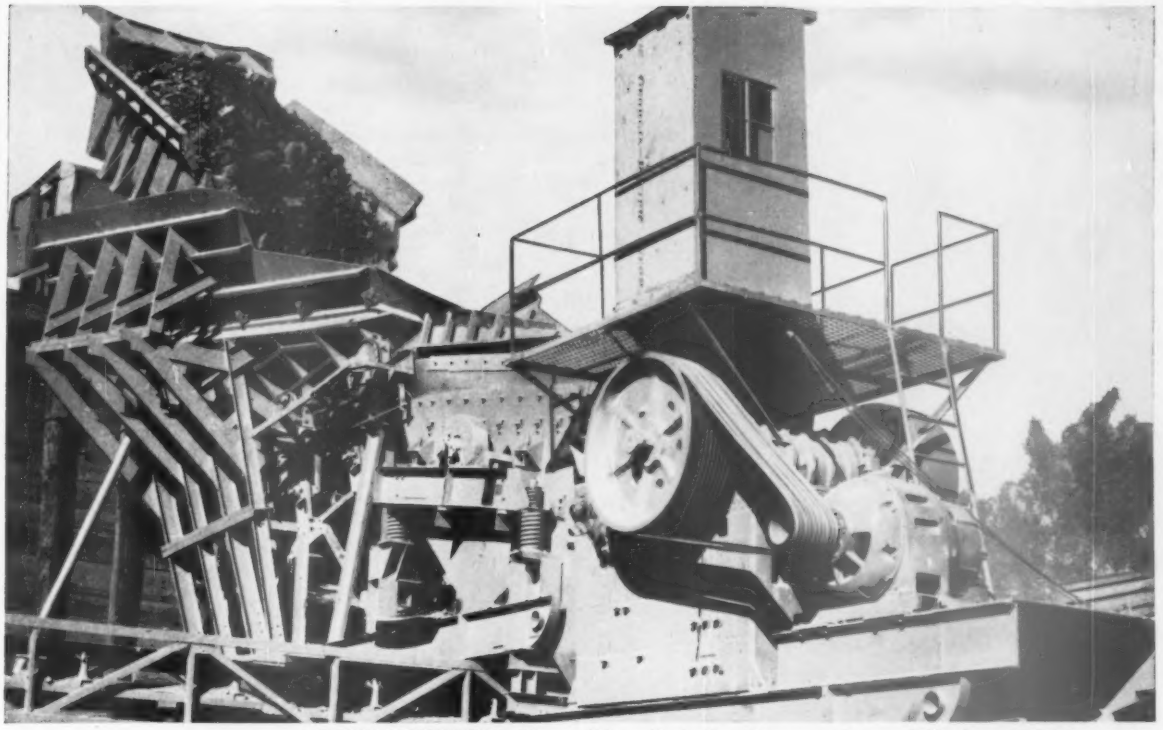
Pennsylvania Glass Sand enters fuller's earth field

WITH THE ACQUISITION of Floridin Co., Tallahassee, Fla., producer of fuller's earth, Pennsylvania Glass Sand Corp. expanded its operations. The Lewistown, Pa., company exchanged 35,840 shares of its common stock for all the capital stock of Floridin.

William J. Woods, Jr., vice president of the parent firm, said the purchase will enable his company to expand marketing operations from the glass, ceramic and metallurgical fields to the oil refining, agricultural chemical as well as to commercial absorbent industries.

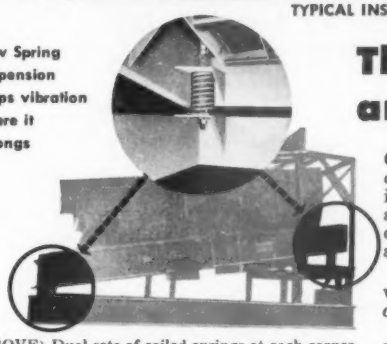
Enter 223 on Reader Card

(Continued on page 160)



TYPICAL INSTALLATION of Pioneer Primary Plant with scalping screen between 14′ feeder and 3042 jaw crusher

New Spring Suspension keeps vibration where it belongs



(ABOVE) Dual sets of coiled springs at each corner of screen frame actually float the screen to prevent transfer of vibration to the supporting structure. This is *an exclusive feature* of PIONEER Vibrating Screens that increases screening efficiency while protecting the frame and structure.

There's only one "best" way to design an efficient stationary quarry plant

Overall design of an efficient stationary quarry plant calls for thoughtful probing in at least four important design areas: 1) installation cost, 2) plant components, 3) performance records, and 4) maintenance expense.

And when you get right up to the wire, you'll generally find there's really *only one best way* to design it.

Let's consider, for a moment, how PIONEER checks out in these areas:

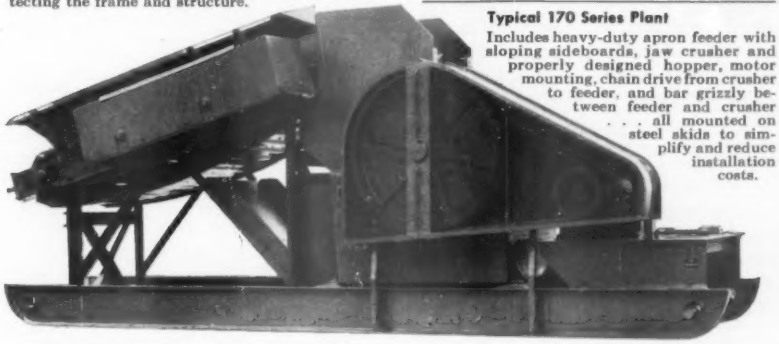
Installation cost. All major components are designed as completely integrated units to facilitate field erection. (See, for example, skid-mounted feeder and crusher shown at bottom left.)

Plant components. Construction of PIONEER Feeders, Crushers, Screens and Conveyors is based on improved design features that make them brutes for sustained strength and smooth operation. (Secondary spring suspension of vibrating screens is a typical example.)

Performance record. PIONEER heavy-duty feeders and overhead eccentric jaw crushers are more often specified for the really tough jobs than are other feeders or crushers.

Maintenance expense. PIONEER Plants are built to give long and satisfactory service under the most strenuous operating conditions and with an absolute minimum of maintenance.

For all the facts, see your nearby PIONEER Distributor or write PIONEER ENGINEERING, Minneapolis 14, Minn.



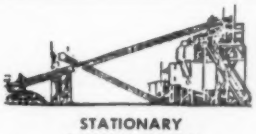
Typical 170 Series Plant

Includes heavy-duty apron feeder with sloping sideboards, jaw crusher and properly designed hopper, motor mounting, chain drive from crusher to feeder, and bar grizzly between feeder and crusher . . . all mounted on steel skids to simplify and reduce installation costs.

Pioneer®
ENGINEERING
DIVISION OF POOR & COMPANY, INC.

PORTABLE CRUSHING PLANTS

WASHING PLANTS



STATIONARY QUARRY PLANTS

BITUMINOUS MIXING PLANTS

BITUMINOUS PAVERS

Enter 1280 on Reader Card

(Continued from page 158)

40-ton crane

THIS NEW 40-TON crawler crane in the 1¼ cu. yd. class is equipped with a number of new and outstanding features. It incorporates the manufacturer's "shear-ball" connection between crawler and turntable—a huge single-race ball bearing.

With a torque converter, the engine cannot stall under any loading. The converter relieves engine, cables and transmissions from stresses of heavy digging or lifting with dragline, clamshell or crane service.

Pneumatic controls give the operator finger-tip control. Two levers control the single or combined operation of crawlers and turntable clutches while retaining the normal "feel" of the machine. *The Thew Shovel Co., Lorain, Ohio*

Enter 224 on Reader Card

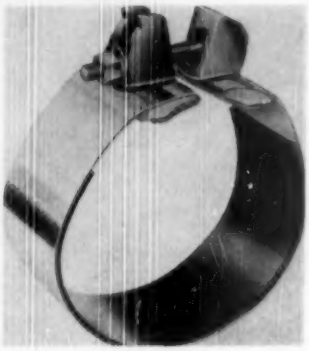
Dust mask

THE ENTIRE VOLUME of this new Resp-R-Aid mask is a single piece of molded lightweight urethane foam. It has more than twice as much effective filtering area than conventional masks of the same size. In addition, it has extremely low breathing resistance, is light in weight and comfortable to wear. These features should go far toward removing the aversion many rock products producers' employes have for wearing masks when working in dusty areas.

The plastic filter has been molded with rounded edges to give a snug yet comfortable fit against the face. The filter itself is an inert plastic which can be washed repeatedly; it does not absorb odors, will not mildew and cannot deteriorate. *Watchmoket Optical Co., Inc., 232 W. Exchange St., Providence 3, R.I.*

Enter 225 on Reader Card

Pipe repair clamp



FOR TEMPORARY OR PERMANENT repair of broken or leaky pipes this heavy-duty repair clamp should be ideal. A Buna-N pad is bonded to a steel strap which can be snapped into place around the pipe to be repaired. The "Patchmaster" is available in widths 3, 6, 9 and 12 in. *Marman Div., Aeroquip Corp., 11214 Exposition Blvd., Los Angeles 64, Calif.*

Enter 226 on Reader Card

Bottom dump trailer

THIS NEW BOTTOM-DUMP TRAILER has a third, rear-door dump opening in addition to the usual two bottom doors. As a result, the new PW 21 unit can dump its load instantly with no hang up. It rides over, rather than through the dumped material, greatly adding to its turn-around speed.

The new trailer is constructed entirely of high-strength steel. The 21,700-lb. body can haul a payload of 35 tons, or 27 cu. yd. heaped. Doors are closed with a hydraulic ram and are locked rather than merely held closed. When opening, the doors can be opened instantly or can be opened slowly for distributing the load in a windrow. *Athey Products Corp., 5631 W. 65th St., Chicago 38, Ill.*

Enter 227 on Reader Card

New tractor

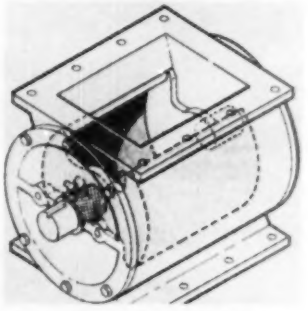
A GIANT NEW CRAWLER TRACTOR is in production which is rated at 211 net hp. This model, the C-6, is the culmination of the maker's 5-yr. testing and development program on proving ground and in actual productive operation.

All major components are out in the open, easily accessible for inspection and maintenance. Its diesel engine cooling system is rear-mounted to improve operator visibility and to permit close coupling of front end attachments. An outstanding feature is a torque converter with semi-automatic transmission that eliminates the master clutch: Speed changes are made under full engine power.

Bare operating weight is about 42,000 lb. with top speed nearly 8 mph. Track gauge of the 15 ft. long machine is 78 in. with standard 22-in. wide shoes. *Euclid Div. General Motors Corp., Cleveland 17, Ohio.*

Enter 228 on Reader Card

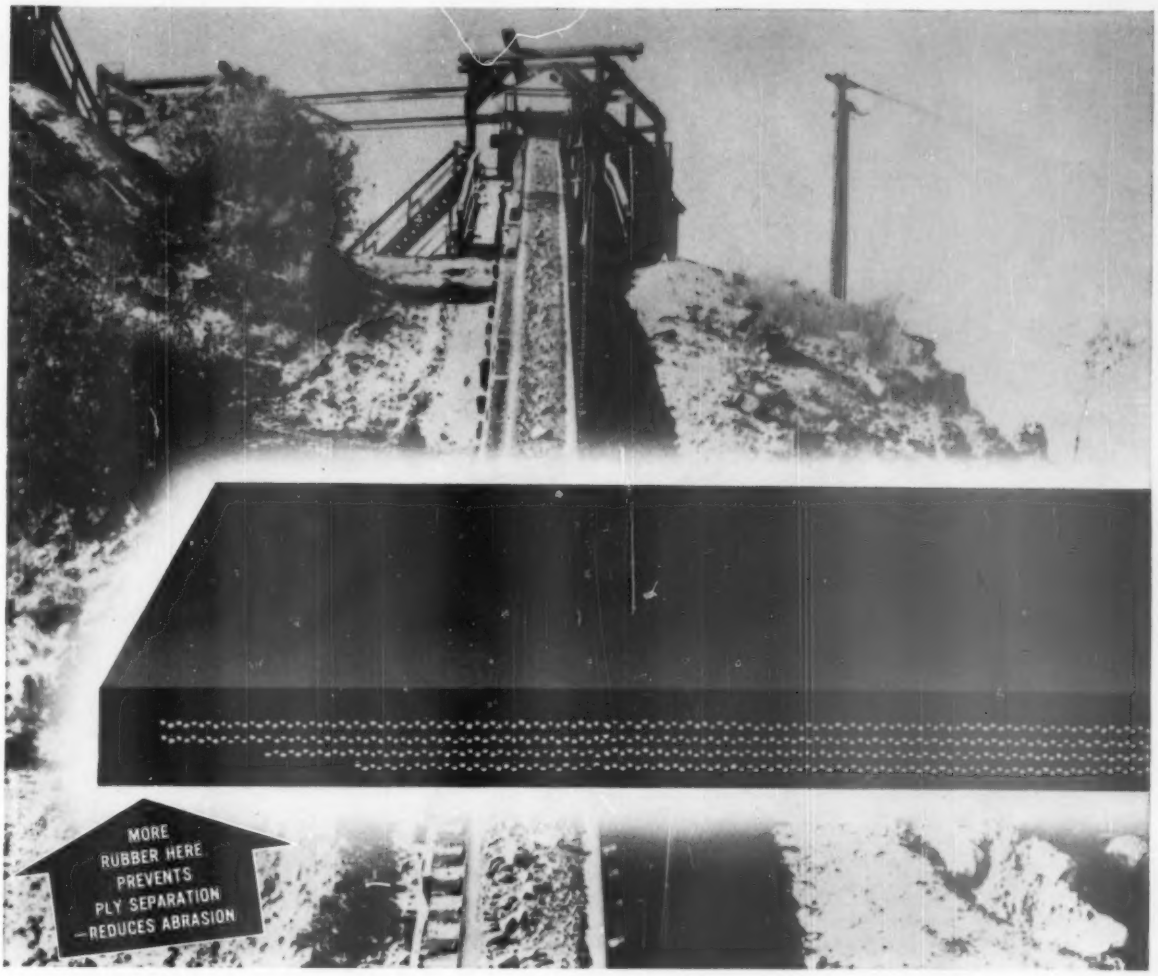
Double-seal rotary valve



POWDERS AND FINE MATERIALS can be controlled with this rotary valve. A double seal with unusually close tolerances and clearances prevents leakage of fine materials when closed. An unrestricted, full-throat opening permits the free flow of materials which have a normal tendency to hang up above the valve. It is ideal for handling cement, lime, gypsum and fine, crushed raw materials.

The valve itself has carefully machined shafts to assure free movement of the rotor. The shafts are supported in dust-tight bearings, making the whole assembly adaptable to either manual or remote-controlled motor operation. *Fuller Co., Catasauqua, Pa.*

Enter 229 on Reader Card



EXCLUSIVE "COLEDGE"* CONSTRUCTION

gives Quaker Thermoid Conveyor Belting extra life where it counts

Unique "Coledge" construction puts more rubber *at the edges* where it's needed, prevents ply separation, makes a more flexible and wear resistant edge where abrasion is greatest. Punishment at the edges—especially the tough use dealt out in quarrying—can kill most conveyor belting in a fraction of the lifetime of Thermoid-Quaker belting.

Tests show Thermoid-Quaker "Coledge" construction lasts and lasts on the same jobs where other belting fails. "Coledge" construction is available on all grades of Thermoid-Quaker belting.

What's more, all Thermoid-Quaker conveyor belting is prestressed in manufacture, so that the belt is actually in compression when you get it—ready for the heaviest load without strain.

Examine Thermoid-Quaker Belting with the exclusive "Coledge" construction at your Thermoid distributor's, or write for further information to Thermoid Division, H. K. Porter Company, Inc., Tacony & Comly Streets, Philadelphia 24, Pa.

*Patent Applied For

THERMOID DIVISION PORTER H.K. PORTER COMPANY, INC.

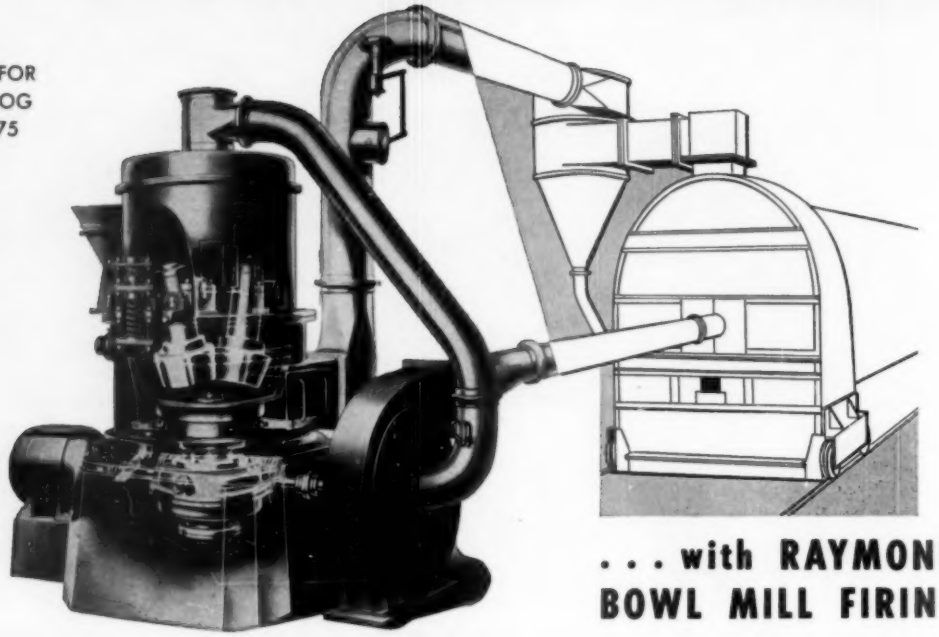
PORTER SERVES INDUSTRY: with Rubber and Friction Products—THERMOID DIVISION; Electrical Equipment—DELTA-STAR ELECTRIC DIVISION, NATIONAL ELECTRIC DIVISION; Specialty Alloys—RIVERSIDE-ALLOY METAL DIVISION; Refractories—REFRACTORIES DIVISION; Electric Furnace Steel—CONNORS STEEL DIVISION, VULCAN-KIDD STEEL DIVISION; Fabricated Products—DISSTON DIVISION, FORGE AND FITTINGS DIVISION, LESCHEN WIRE ROPE DIVISION, MOULDINGS DIVISION, H. K. PORTER COMPANY de MEXICO S. A.; and in Canada, Refractories, "Disston" Tools, "Federal" Wires and Cables, "Nepcoduct" Systems—H. K. PORTER COMPANY (CANADA) LTD.

Enter 1267 on Reader Card

Get high-level efficiency...

IN COAL FIRING AND KILN PERFORMANCE

WRITE FOR CATALOG NO. 75



. . . with RAYMOND BOWL MILL FIRING

THE success of the Raymond Bowl Mill is told by its impressive record: A quarter-century of service to industry . . . more than 390 units in use on kiln firing alone . . . total rated capacity in excess of 18½ million tons of coal annually . . . world-wide application on rotary kilns for lime, cement, dolomite and other products. Summing up the following advantages, will show why the Raymond Bowl Mill develops maximum BTU utilization of powdered coal.

BOWL MILL

- Handles coal of any grade or moisture content
- High availability and wide range capacity
- Maintains uniform grind and proper coal-air mixture
- Flexible control and automatic operation
- Noiseless, dustless operation
- Record low maintenance

ROTARY KILN

- Increased kiln production
- Superior quality of lime or cement
- Large savings in fuel costs
- Maximum burning efficiency
- Overall operating economy
- New low costs in cement and lime production.

COMBUSTION ENGINEERING, INC.

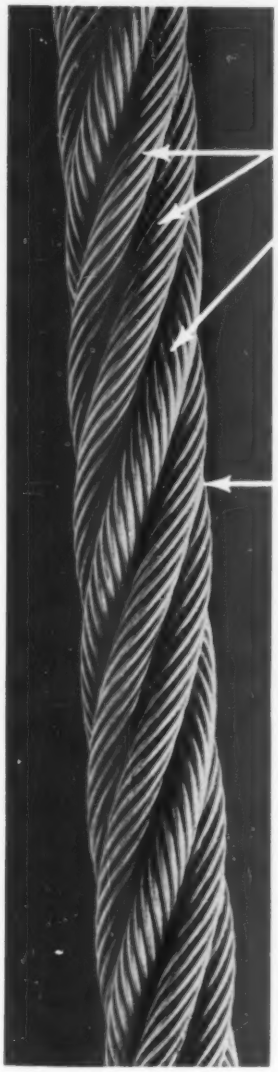
Raymond Division

1108 W. BLACKHAWK ST.
CHICAGO 22, ILLINOIS

Combustion Engineering-Superheater Ltd., Montreal, Canada

SALES OFFICES IN PRINCIPAL CITIES

Enter 1279 on Reader Card



Herringbone's two pairs of Lang lay strands and one pair of regular lay strands provide the ideal combination of maximum flexibility with good stability.

Finer wires inside contribute to Herringbone's excellent drum-winding characteristics.

Heavier outside wires in each strand have greater resistance to abrasion.

"Herringbone* saves our equipment"

AMICO SAND AND GRAVEL COMPANY

Read this about the most exciting wire rope development in years . . . "Turning a profit on any product often boils down to something that will do a specific job better than anything else. Our equipment operators prefer Roebling Herringbone to any other for heavy lifts, clam shell, drag, pan work or dozers. The savings on sheaves, because of Herringbone's perfect tracking, are a big item as far as we are concerned."

Amico Sand and Gravel Company, Morrisville, Pennsylvania, and Riverside, New Jersey, has told you what this combined regular lay and Lang lay rope—two-ropes-in-one—is doing for them. Roebling is in a position to *show* you how the new Herringbone can, again, in the words of Amico ". . . give you a chance to turn more profit on production equipment." Write to Wire Rope Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey, for the full and fabulous facts.

*Reg. App. For

ROEBLING

Branch Offices in Principal Cities
Subsidiary of The Colorado Fuel and Iron Corporation

ROEBLING
HERRINGBONE
WIRE ROPE

Enter 1268 on Reader Card

Allis-Chalmers unveils fuel-cell powered tractor

"OUR BUSINESS IS POWER and will continue to be," an Allis-Chalmers vice president told members of the press gathered at a news conference in October. Then this big maker of electrical, fuel and now atom-powered equipment, unveiled something brand new—a fuel-cell powered farm tractor model.

Most promising fact about the fuel cells is their amazing potential efficiency, something close to 85 percent. In comparison, today's gasoline and diesel engines deliver no more than 40 percent of the chemical energy latent in their fuels. By converting chemical energy directly to electrical energy, without heat and without moving parts, the fuel cells gain their impressive efficiency, A-C explained.

Fuel-cell electricity was put to work in a dramatic, practical way by this farm tractor. Pulling a two-bottom plow, the fuel cells burned the fuel equivalent of only 1/3 gal. of gasoline during the 17-min. run

Mounted on a standard A-C tractor chassis, the fuel cell unit supplies current to a 20-hp. electric motor which, in turn, has enough power to pull a two-bottom plow through hard packed Wisconsin soil. A mixture of gases — largely propane — fuels the cells. The gases are fed to the cells and react there in an electrolyte. Chemical reactions in the cells cause a direct current to flow, much as in a storage battery.

Actually, the fuel cell idea is very old, the first one being described in 1839 by Sir William Grove. Many others have investigated the idea since. Recent research has been done by Pittsburgh Consolidated Coal & Coke Co., National Carbon Co. and others in this country and overseas.

Most likely applications? Allis-Chalmers suggests a few. Fuel is no problem—hydrogen and oxygen can be used, and can be made cheaply from water by running an electric current through it. The current, A-C suggests, could be taken from electric power plants during their off-peak hours.

Such processes as electroplating, water purification, and electrolytic refining of metals, all of which use low-voltage constant-load electric power, are likely uses. Another use might be submarines which, traditionally, have been powered by dc. electric motors when under water. In fact, any process which requires direct current is a likely application. Though the A-C farm tractor fuel cell unit looks bulky and costly to make, the cells can be stamped from sheet metal quite cheaply, A-C reports. "Fuel cells of the future may provide electric power for homes and factories, vehicles such as trucks and buses, or even be used in military weapons or space vehicles," A-C Research Director Dr. H. K. Ihrig told the reporters.

Union Wire Rope now sells through National Supply

SALES ACTIVITIES of Union Wire Rope Corp., Kansas City, Mo., and The National Supply Co. have been combined following the decision to sell Union's wire rope through National's oil field sales division.

Both firms became subsidiaries of Armco Steel Corp. in 1958. Products covered in the new agreement include Tuffy rotary lines, cable tool drilling and casing lines, winch and dozer lines, rod and tubing lines, sand and pump lines, rod hanger lines, and slings. Established in 1927, the firm has become one of the nation's largest makers of wire rope products. National maintains 112 oil field stores in the U. S. and Venezuela.

Kaiser Refractories names Drennan and Tinsley to posts

RUSSEL T. DRENNAN and Eugene C. Tinsley have assumed new positions with Kaiser Refractories and Chemicals Division, Kaiser Aluminum & Chemical Sales, Inc. The Division was formed as a result of the recent merger of the Mexico (Mo.) Refractories Co. and Kaiser Aluminum & Chemical Corp.

Mr. Drennan is now director of sales for the division; he had been general sales manager for Kaiser Chemicals. Mr. Tinsley, formerly Mexico Refractories' vice president and director, becomes director of marketing for the division.

(Continued on page 166)

"Spotty, as a digger, you just ain't got it!"

Without realizing it, Billy has hit upon a basic truth in the excavating business. To come out on top, you've got to use the best equipment for the job.

With many factors beyond a contractor's control, choosing the right equipment becomes especially important. For this is one thing a man *can* control.

That's why so many contractors choose Bucyrus-Erie. They have learned . . . as their fathers did before them . . . that B-E machines are built for more than ordinary digging. They are built to handle the toughest jobs — and still perform better.

BUCYRUS ERIE

(Continued from page 164)

Massey-Ferguson chooses John Vilven as sales manager

JOHN VILVEN, formerly western regional industrial sales manager, has been named general sales manager for Massey-Ferguson Industrial Division. Earlier, Mr. Vilven had been western regional manager for Mid-Western Industries, Inc., a firm Masey-Ferguson acquired in mid-1957. The firm makes industrial tractors, equipment.

Louis Allis builds research center at Milwaukee

THE LOUIS ALLIS CO., maker of electric motors, generators and adjustable speed drives, is building a research and development center in Milwaukee's suburban Greendale. To be staffed by 100 engineers and technicians, the center will double the size of the present engineering and physics labs. The firm's research plans include work in both the electronic and nuclear power areas and will permit even greater penetration into industrial and military fields, announced Engineering Vice President R. R. Wieseman.

New firm announced which will design rock plants

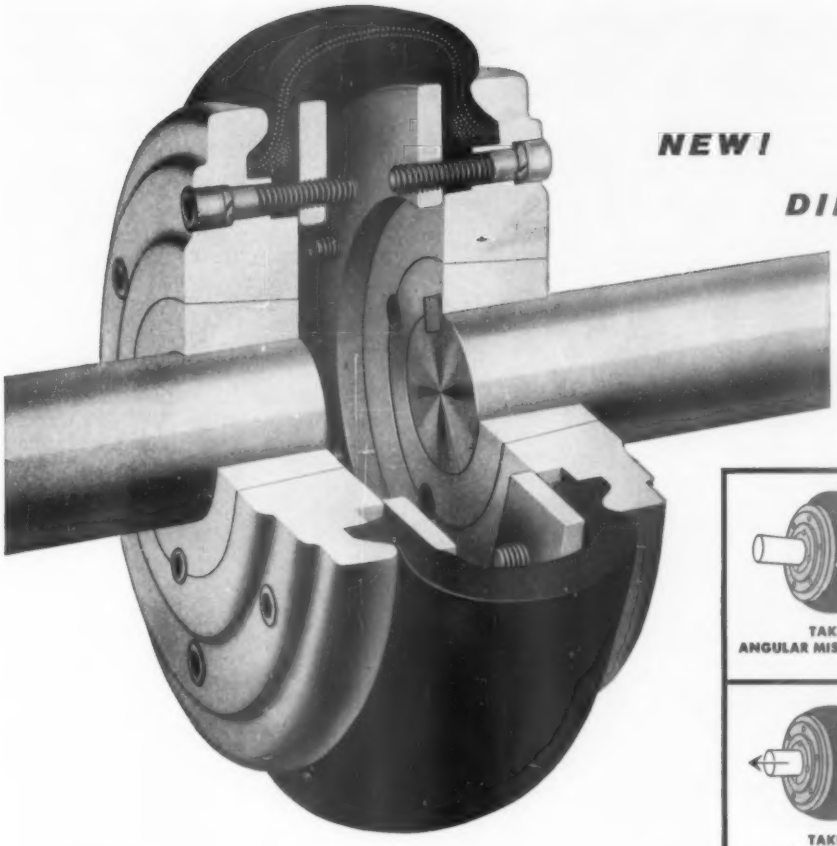
P-T ENGINEERING CO., Denver, Colo., has been formed to design and engineer overland conveyor systems, crushing, screening and washing plants and all phases of bulk materials handling systems. With the Rocky Mountain region growing quickly in population, contractors and manufacturers will be installing faster and less expensive means of conveying bulk materials, the new firm believes. So its founders plan to specialize in this overland-conveying area.

Officers are Harry C. Bullock, president; J. R. Torpey, vice president and chief engineer; John Flynn, secretary and treasurer. Directors are Sherman R. Lyman, Paul D. Pierce, plus Mr. Torpey and Mr. Bullock.

St. Regis Paper builds West Coast bag plant

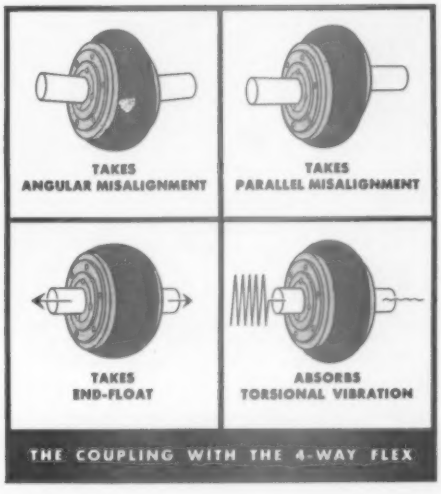
A NEW $1½ MILLION PLANT is now being built by St. Regis Paper Co. in the Vail Field area near Los Angeles, to produce every type of multiwall paper bag including the firm's stepped-end bag. Set to begin operations sometime next year, the plant will replace the firm's present Los Angeles area bagmaking facility with an operation nearly double in size.

(Continued on page 168)



NEW!

DIFFERENT!



DODGE

Para-flex

FLEXIBLE CUSHION COUPLING

THIS coupling "swallows up" shaft misplacements. It automatically compensates for end-float, parallel misalignment, angular misalignment *or any combination of all three.* Moreover, it cushions the stresses of shock loads. And it absorbs torsional vibration—reducing noise and protecting machinery from vibration's destructive forces.

Here is a new type of performance—made possible by the development of a tire-like flexing element. Synthetic tension members, bonded together in rubber, give this element the stamina and dependability of modern, high-speed, high-load, shock-absorbing truck tires—and the ability to respond magically to all manner of changing shaft conditions.

Para-flex takes minimum space on the shaft. Mounting is simplified through the use of standard Taper-Lock bushings—no reboring, no machining. Safety is promoted by flush design; there are no protruding parts. No lubrication is required, no periodic inspection. And since the flexible member is molded with a transverse split, it can be replaced *without moving either the driver or driven machine.*

Para-flex Couplings are stocked by Dodge Distributors in popular transmission sizes. They are available from factory stock in capacities up to 2000 hp at 1080 rpm. Call your distributor for a coupling to *make your own test.* You'll witness something revolutionary!

DODGE MANUFACTURING CORPORATION, 2600 Union, Mishawaka, Ind.

DODGE

of Mishawaka, Ind.

CALL THE TRANSMISSIONEER—your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look in the *white* pages of your telephone directory for "Dodge Transmissioneer."

Enter 1266 on Reader Card

(Continued from page 166)

Soiltest's Van Zelst named vp. of Cenco Instruments

THEODORE VAN ZELST, president and founder of Soiltest, Inc., has been named a vice president of Cenco Instruments Corp. and a director of Central Scientific Co., a Cenco subsidiary. Cenco acquired Soiltest last June.

Mr. Van Zelst started Soiltest in 1946 while a graduate student at Northwestern University's Technological Institute. Starting out with a small soil testing laboratory, he soon entered

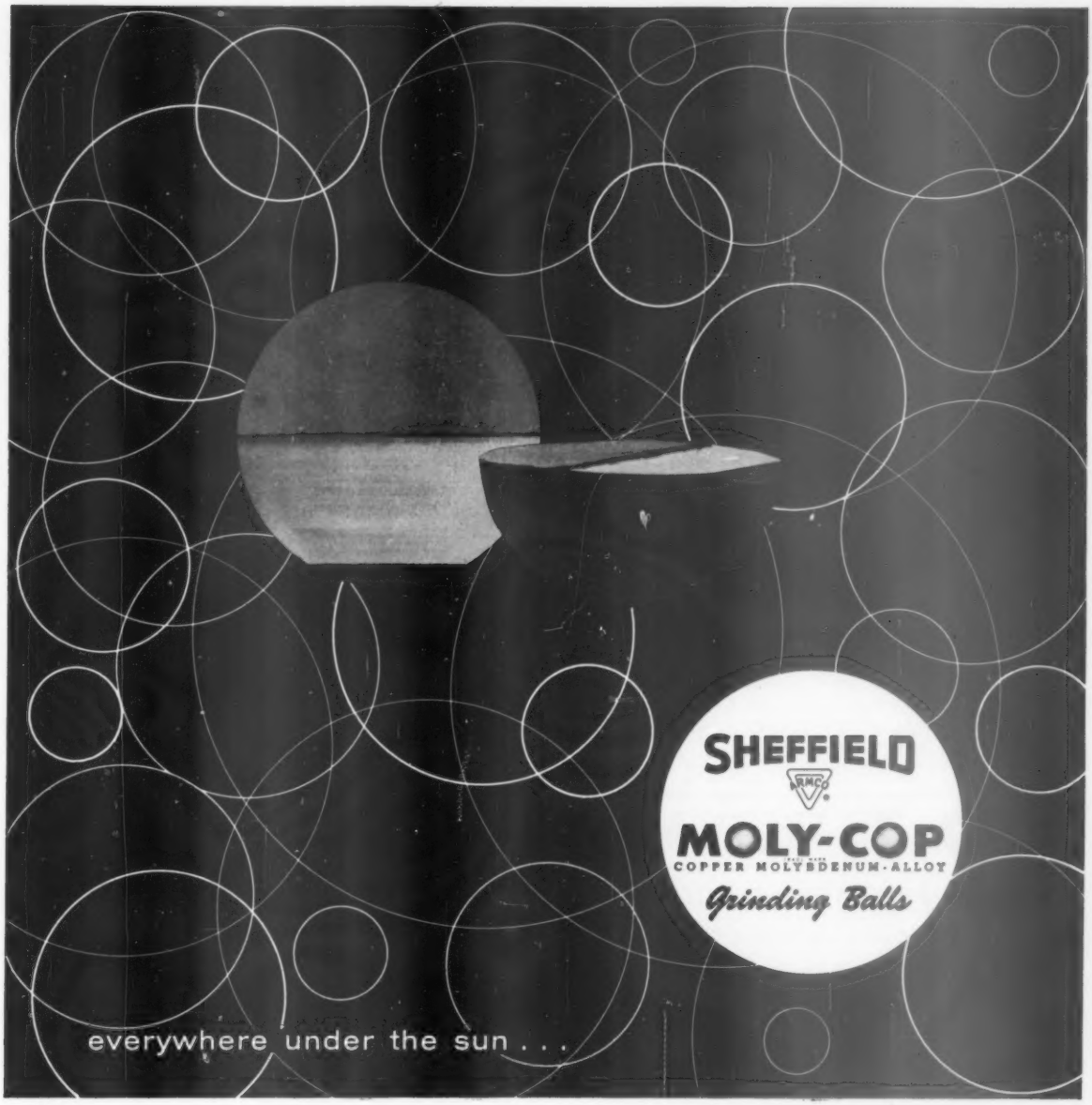
the business of making engineering test apparatus. Today the firm has sales representatives in 90 counties, and is one of the largest in its field. Soiltest makes testing equipment for soils, concrete, asphalt and construction materials. Parent Cenco is one of the leading makers of scientific apparatus and laboratory supplies.

Lane named to Chicago Pneumatic Tool post

CARRA L. LANE has been appointed manager of plant operations for the Chicago Pneumatic Tool Co., a post involving responsibility for operations of the company's domestic plants at Utica, N.Y.; Franklin, Pa.; and Fort Worth, Texas. He will also coordinate operations at the company's subsidiaries from his New York office.

A graduate of the Georgia Institute of Technology, Mr. Lane has served as president and general manager of the Security Engineering Division of Dresser Industries, Inc. Prior to his association with Dresser he was vice president and general manager of the Walker-Turner Division of the Kearney and Trecker Corp.

(Continued on page 170)



The Standard of Comparison for LONGER LASTING ROUNDNESS

Performance tests by mills all over the world show Moly-Cop balls retain their spherical shape longer. That's because the alloying, forging and heat treating techniques used by Sheffield assure uniform quality to the very core of the ball. It means you'll get longer service, less down-time and other important production economies with Moly-Cop balls.

SHEFFIELD DIVISION

New steels are born at Armco

ARMCO STEEL CORPORATION

OTHER DIVISIONS AND SUBSIDIARIES: Armco Division • The National Supply Company • Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Union Wire Rope Corporation • Southwest Steel Products

Enter 1263 on Reader Card

MANUFACTURERS NEWS

(Continued from page 168)

Companies announce recent appointments

APPOINTMENT OF Roy E. Goodwill, Jr., as manager, general products division sales, central region, and of William R. Carlyon as manager, general industrial sales, Detroit district, has been announced recently by Allis-Chalmers.

In Columbus, Ind., Cummins Engine Co., Inc., has announced the appointment of five men to new positions as divisional sales managers: R. F. Davis, midwest division, Chicago; G. W. Paine, Canadian division, Toronto; G. A. Daum, western division, San Francisco; F. J. Loeloff, eastern division, New York; and R. R. MacDonald, southern division, Atlanta.

Bemis Brothers Bag Co. has made three changes in eastern personnel: R. V. Scott, director of eastern operations and company director, New York, will transfer to St. Louis as assistant director of sales. A. F. G. Raikes, manager, New York general sales division, will assume Mr. Scott's duties as director of eastern operations and will be succeeded by J. B. Goolsby, area sales manager at the Brooklyn sales division.

James E. Challis is the new chief application engineer, Industrial Equipment Sales Division of Barber-Greene Canada Ltd., Ontario.

Denver Equipment Co. has transferred Mr. C. A. Richardson to Tucson, Ariz., to head a new sales and service program.

Managing the Detroit district sales office of Patterson Foundry and Machine Co. will be John N. Lewis, replacing A. T. Jacobson, the present general sales head.

John J. Finnerty has been named Chicago sales representative for the W. W. Sly Mfg. Co., Cleveland, Ohio.

Tom Brockway will represent the Trojan Division of Yale & Towne Mfg. Co. in Texas, Oklahoma, Kansas and Western Missouri.

The Daybrook Hydraulic Division of Young Spring & Wire Corp. has appointed John G. Notheis as north central zone manager.

Leeds and Northrup, Philadelphia, Pa., has announced the following changes in its sales staff: Edwin A. Yeo, Jr., has been promoted from district manager in Chicago to assistant manager in the sales division. Willard H. Neu moves to the Chicago post. Manley S. Nolen transfers from Cincinnati district manager to Pittsburgh. Charles W. Sullivan, branch manager of the Columbus office, advances to Cincinnati district manager.

Robert J. Filippine has been named sales manager for Building Materials Division East, A. C. Horn Co., division of Sun Chemical Corp. He will be headquartered in North Bergen, N.J.

Ray J. Stanish will head the new Chicago sales engineering office of Thompson-Ramo-Wooldridge Products Company.

Edwards G. "Ned" Stanhope, a veteran of 14 years in New England business and industry, has been named Yale Hoisting Equipment district manager for that area by the Yale Materials Handling Division of Yale & Towne Mfg. Co.

B. G. Oswald is now associated with Globe Woven Belting Co., Buffalo, N.Y., as a sales engineer.

Denver Equipment Co. has named James E. Quinn manager of the western division, headquartered in Denver, Colorado.

Charles Herrin has been named sales manager, two-way radio products, for Motorola Communications and Electronics, Inc.

The newly-created post of assistant general sales manager, Gilman Paper Co., goes to H. D. Wellington.

EVERYONE'S INVITED!

NATIONAL CRUSHED STONE ASSOCIATION

43rd Annual Convention
and
Manufacturers Division Exposition

February 22, 23, 24, 1960
CONRAD HILTON, CHICAGO, ILLINOIS

Timely and Informative Subjects
by Nationally-Known Speakers

Discussions of Special Interest to
Executives, Operating Men, and Salesmen

Exhibits Featuring the Newest Developments
in Machinery and Equipment

for special reservation cards
write . . .

NATIONAL CRUSHED STONE ASSOCIATION

1415 Elliot Place, N. W. **Washington 7, D. C.**

WHERE TO BUY

Mail to: **ROCK PRODUCTS**, Where To Buy Dept., 79 West Monroe St., Chicago 3, Illinois

DATE _____

ADVERTISER _____

BY _____

ADDRESS _____

CITY, ZONE & STATE _____

Remittance Enclosed
Terms: 10 days after receipt of invoice

RATES FOR ONE INSERTION

Column Inches Used	Rate Per Column Inch
Space (Inches)	1 Issue
1	$10.25
2-9	10.00
10-19	9.75
20-30	9.50

Lower rates on a contract basis. Write for rate card.

ATTACHED COPY to appear in issue(s) checked

Forms close 12th of Month Preceding Publication

Jan.	July
Feb.	Aug.
Mar.	Sept.
Apr.	Oct.
May	Nov.
June	Dec.

BLIND ADVERTISEMENTS
Box Numbers will be assigned to ads without extra charge, if the advertiser desires.

Send inquiries to the Box Number c/o Rock Products, 79 W. Monroe St., Chicago 3, Ill. They will be forwarded to the advertiser. Rock Products cannot disclose advertisers' name or answer inquiries.

APRON FEEDER: Heavy duty 4 ft. x 14 ft. with 15 H.P. motor.

JAW CRUSHERS: 18 x 30, 36 x 42, 40 x 42, 48 x 60, 56 x 72", all steel, with or without motors and controls.

BALL MILLS: Two 7 ft. x 24 ft. with or without motors. Hardinge 8 x 36 and 8 x 48" Conical mills complete with 2200 volt motors.

KILNS: Two 8' x 125 ft.

HAMMER MILL: 350 tons per hour, 6 to 10" material down to 1¼" product.

AUTOCLAVES: Two 6'6" x 66 ft., 150 lbs. pressure.

CONVEYORS: One 36" and one 42" x 736 ft., complete with all equipment and supporting structure.

LOCOMOTIVES: One General Electric 25 ton and one 44 ton, standard gauge, diesel electric.

HOISTS: Lidgerwood single drum 7' dia., 5'7" face, 32,000 lbs. pull, 1⅝" rope, 250 or 450 FPM, 150 or 250 H.P. One single drum Nordberg 5' dia., 5' face, 1¼" rope, 100 H.P., 750 FPM. One Nordberg double clutched drum 10' x 10', 1½" rope, 1250 H.P., 1200 FPM. All the above with post brakes, Lilly controls, 2200 volt motors and controls. Other hoists 100 H.P. to 2500 H.P.

WE BUY AND SELL EQUIPMENT THROUGHOUT NORTH AND CENTRAL AMERICA

A. J. O'NEILL
Lansdowne Theatre Building
LANSDOWNE, PA.
Phila. Phones: MAdison 3-8300—3-8301

DESIRABLE EQUIPMENT AT REALISTIC PRICES

Oliver Rotary Vacuum Filters
Rotary Dryers & Kilns to 260'
Complete Flash Drying System
American Ring Roll Crusher
Williams & Gruendler Hammer Mills
Conical Ball Mills; Hi Side Mills
Raymond Mills; "00", "0000", #10, 47, 40
Fuller Pulverized Material Coolers
Day Autoclean-Rotoclone Dust Collectors
Screens and Sifters by Tyler-Hummer, Patterson, Day, Williams, Allis-Chalmers
Dings and Williams Magnetic Separators
Sturtevant Whirlwind Air Separator
Raymond 30" Dbl. Whizzer Separator
Baker-Perkins Slurry Thickener

FIRST MACHINERY CORP.
209-289 Tenth St. Bklyn. 15, N. Y.
STerling 8-4672

TITANIUM PLANT

1—Traylor 11' x 155' Rotary Kiln, 2 tires, welded, ⅞" shell.
1—Rennenberg 6' x 60' Rotary Kiln.
2—Abbe 5' x 16' Ball Mills.
3—Bucket Elevators; 25', 32', 30'.
2—Aurora 24" Vert. Cent. Pumps, 200 HP motors, 5000 gpm, 125' head.
1—Bemis Automatic Bag Packer, Sewing Machine, Conveyor and Flattener.
1—Deep Well Pump, 75 HP Motor.
1—8' x 8' Oliver Precoat Filter.
6—Dorr Thickener Mechanisms, 16'.
18—Steel Buildings 20' to 80' wide x 60' to 140' long.
2—20 ton Overhead Cranes, 30' & 35' spans.
8—Redler Conveyors; 30', 35', 40', 75', 80' and 125' long.
200'—Screw Conveyor, 9" and 12".

SEND FOR CIRCULAR
REPRESENTATIVE ON PREMISES
Field Sales Office, Broening Highway
Baltimore, Md.
Telephone: Medford 3-2911

Your Inquiries Solicited—Send for Circulars

BRILL EQUIPMENT COMPANY
35 Jabez Street, Newark 5, N. J.
Tel: Market 3-7420

ELEC. AIR COMPRESSORS
6—Inger Rand, 1350, 2200 & 3800'
DIESEL ELEC. LOCOMOTIVES
4—65 ton Whitcomb 2—25 ton & 2—20 Ton
2—45 ton & 1—80 ton & 4—100 ton Gen. Elec.
25 ton Amer. Diesel Loco Crane
ROTARY DRYERS & KILNS
3' x 20', 5' x 25', 6' x 72', 9' x 160', 10' x 200', 5' x 35' Ruggles-Coles XA-8 Dbl. Shell.
REDUCTION MILLS & FEEDERS
5' x 10', 6' x 12" & 7' x 15' Rod Mills
2—KVS 5' x 8' Ball Tube Mills Air Swept
2—No. 77 & No. 54 Marcy Ball Mills
6' x 18' Allis Chalmers Tube Mill
30" x 42" & 24" x 36" Pioneer Jaw Crushers
30" x 36", 36 x 42 & 48 x 60 Jaw Crushers
25B Telsmith Primary Breaker
20" x 36" & 24" x 36" Pioneer Jaw Crusher
9" x 21" Telsmith Roller Bearing
14" x 28" New England Road Machinery
15x24 & 10x36 Cedar Rapids Jaw
36" & 42" Stedman Disintegrators
36" x 54" Buchanan Jaw Crusher
Bradley Improved Hercules Mills (3)
#5057 Raymond 5 Roll Highside Mill
4' x 10' Tyler Hummer DD Screen
3—200 HP & 160 HPSD. Ottumwa Elec. Hoists.
ELEC. WHIRLEY CRANES
2 Amer. R20-60 Ganty 139' Boom

WANTED TO BUY
KILNS—DRYERS—CRUSHERS
R. C. STANHOPE, INC.
60 E. 42nd St., N.Y. 17, N.Y.
TEL. MU 2-3676 & 2-1898

SPECIALS

#1, #0 Raymond Mills
6'-5"x100' & 6'x120' Kilns
Complete Lime Hydrating plants.

CRUSHERS

1—48" x 60", 42" x 40", 30" x 36", 24" x 36", 18" x 36", 15" x 30", 12" x 24" Jaw Crushers.

2—42" x 16" Allis-Chalmers Crushing Rolls, rebuilt. 36" x 16 rebuilt Sturtevant rolls.

1—6", 10", 16", 20" McCully Superior Gyratory Crushers.

No. 3 up to No. 12 Gyratory Crushers.

BALL & TUBE MILLS

5'x22', 6'x22', 7'x24'

DRYERS

8½'x65' & 8'x60

W. P. HEINEKEN, INC.
50 Broad St., N.Y. Tel. Wh. 4-4236

FOR SALE

2—5½' Symons Std. Cone Crushers, with 200 HP motors 2200 Volt and starting equipment.

5—8' x 9' Traylor Ball Mills, with 250 HP Syn. motors, 2200 Volt and controls.

1—20 Ton American Model 10-90 Derrick, 30 HP.

2—4 x 10 Tyler Hum-mer Screens

1—4' x 31'3" Ruggles Coles Rotary Dryer, Excellent

1—4' x 30' Ruggles Coles Rotary Kiln, Excellent.

6—3 yd. GarBro Cement Buckets.

4—4 yd. Insley Cement Buckets.

1—4 x 10 Marcy Rod Mill, 75 HP Motor.

Machinery Center, Inc.
Salt Lake City, Utah
P. O. Box 964 HU 4-7601

CLEARANCE SALE

SIX CRANES & SHOVELS

1—Lorain "TL25K" ¾ yd. Dragline, Cat. D315 Diesel. Rebuilt.
1—Insley "K-12" ½ yd. Trench Hoe, Chrysler gas, rebuilt.
3—Bantam "M-49" ⅜ yd. Hoe mounted GMC 6x6.
1—Bantam "H-47" ⅜ yd. Hoe on GMC 4x4.
1—P&H New Shovel Attachment, complete.
1—Lorain Used Shovel Attachment—Cheap.

TWELVE TRANSIT MIXERS

Rex 6 Yd. Adjusta-Wate mixer, Chrysler gas, flush tank on International LF19Z tandem. New 1953. Perfect. (2)
Rex 5 Yd. Mixer, Chrysler gas, flush tank on 1955 GMC 620 Tandem.
Rex 5 Yd. Mixer, Chrysler gas, flush tank, rebuilt.
Smith 4½ Yd. Mixer, Continental gas, late model—good shape.

CRUSHING EQUIPMENT

Universal TD24 Gravelmaster, 200 TPH capacity, 1024 R.B. Jaw, 24" Twin Dual Roll, 3x10—3½ deck screen. Ready to work.
Gruendler Portable Hammermill Plant, 3X8 Mill, Apron Feeder, 3 x 6 screen, Cat. D8800, $8,500.

MISCELLANEOUS

Pettibone 250 Speedall, GM Diesel, Excellent.
IHC "TD-14" Diesel Tractor w/Hough Loader, new tracks.
Rogers 20-Ton Low Boy Trailer, Tandem Axle.
Schramm "210" Port. Air Compressor, 2-axle, pneumatics.

All the above Equipment is Located Here in Rockford!

TERMS! TERMS! TERMS!

120 S. Pierpont WO 4-6706

EIGHMY EQUIPMENT COMPANY
ROCKFORD, ILLINOIS

PORTABLE ROCK CRUSHING PLANT

Near St. Louis

LIMA 604 - BACKHOE ATTACHMENT

FOR SALE

Primary Plant 3x10; apron feeder 36x40; Dixie Hammermill; UD-24 International Diesel Engine; 24" conveyor, 24' long for discharge to secondary machine.

Secondary Machine equipped with a 42x30 Gruendler Hammermill; 4x10 double deck Seco screen; D-12000 Caterpillar Diesel Engine; end conveyor 20" wide x 22' long; return conveyor 20" wide x 16' long. This is a closed circuit machine.

These 2 Units are all mounted on exceptionally good rubber and can be transported very easily. This plant is ready to pull into your pit and start crushing, after November 1, 1959. Now in operation in Southern Illinois.

For Quick Sale, We Are Willing To Sacrifice This Plant For $32,000.00.

Backhoe Attachment for Lima 604 Crane, Perfect Condition, Never Used $4,000.00

LAKE COUNTY EQUIPMENT CORP.
1800 Skokie Highway
HIGHLAND PARK, ILLINOIS
Call IDlewood 2-7150, Mr. Allen

SPECIAL

1—10' dia. x 230' long rotary kiln, ¾" shell.
2—7'6" x 100' long rotary kiln.

MILLS

BALL, Kennedy 7' x 9', 150 HP
CONICAL BALL, Hardinge 4' x 16"
COMPEB, Allis Ch., 7' x 24', 450 HP
BALL-TUBE, Allis 5' x 22', 150 HP
ROD, Kennedy 4' x 8', 50 HP, EPD
ROD, Marcy 7' x 15', 300 HP

CRUSHERS—PULVERIZERS

GYRATORY, Kennedy, 49, 12½", 100 HP
JAW, 36" x 15", 20" x 6" 18" x 9"
BABCOCK & WILCOX Type E32, 75 HP
RAYMOND #5057 hi-side mill
RAYMOND, 6 Roll, Low Side, 200 HP
HAMMERMILLS, PENNS. C3-30, 60 HP
HAMMERMILL, PENNA. NON-CLOG #5060, Series #DNC, 400 HP, non-clog, 1952—UNUSED.
ROBINSON 36" Saw-tooth, 15 HP

DRYERS & KILNS

11' x 155' Traylor Kiln, ¾", Shell.
10' x 80' Dryers, ¾" shell.
9' x 100' Kiln, Vulcan, ⅝" shell.
8' x 125' Kiln—⅝" shell
7'6" x 100' Kiln, ½" shell
7'6" x 60' Kiln, ½" welded shell
6' x 7' x 100' Kiln, ⅞" shell
8' dia. x 70' L, Ruggles Coles, ⅝" Shell
7' x 50' Allis-Chalmers dryer, ⅜" shell
6' x 50', Louisville dryer
5'6" x 50', Renneburg, Dryer, ⅜" shell
4'8" x 33', ⅜" Shell. Dryer
4' x 24' L, brick lined kiln.

MISCELLANEOUS

BRIQUETTING PRESSES, Komarek Greaves, 75 HP, 50 HP, 10 HP
PUG MILLS, 25, 50, 150 HP
STEEL BINS—up to 200 tons storage, all welded construction

PERRY EQUIPMENT CORPORATION

1418 N. Sixth St. Phila. 22, Pa.

POplar 3-3505

CHOICE EQUIPMENT AVAILABLE

2—1956-1958 Ford F-800, Trailmobile Tractor Rear Dump Trailer Combination
1—Model D Allis Chalmers Motor Grader
2—¾ yd. Koehring Model 304 Cranes
1—HOD Hough Front End Loader New 1956

WRITE OR CALL FOR PHOTOGRAPHS OR UNITS CAN BE SEEN AT

WEST SAND AND GRAVEL COMPANY, INC.
2801 RADY STREET, RICHMOND, VIRGINIA
TELEPHONE Milton 4-3001

SPECIALS!!!

Buffalo type B 60 ton motor truck scales 45' x 12' platform, tape recorder and printer
Fuller-Kenyon Type "C" cement unloader. NEW
Fuller Kenyon Airslide cement conveying system
Schramm 600 ft. portable air compressor. GMC.
Gardner-Denver 600 ft. air compressor, portable.
Lorain Model L-50 shovel 1 yard. Diesel
Koehring Model 304, crane ¾ yd.; 50' boom. Diesel
Hough Model HR Payloader. Diesel 1½ yd.
Int. TD-142 Skid shovel 2¼ yd.

CONCRETE MIXERS

Koehring Model 16-E Twinbatch concrete paver
Ransome Model 84S, 8 yd. tilting type
Koehring Model 56S 2 yard tilting type

TRUCKS—TRANSIT MIXERS

4 Mack B-63-6 trucks, 12 yds. Heil dump bodies.
10 Euclid 28 FD rear dumps 15 ton cap. Cummins
13 Euclids rear dump 12 FD 15 ton; 7 Euclid bottom dump 45 RDT 18 ton
4 Jaeger Transit Mixers 5½ yd. Hi-Dis. New 1957
3 Jaeger 5½ yd. Hi-Dis. Autocar.
6 Worthington 7 yd. transit mixers on 6 cyl. Diesel. Mack tandem trucks. High discharge. Some new cond.

CRUSHERS—KILNS—DRYERS

JAW: Acme 10x20, 15x36, 14x26, 14x28, 10x42, 16x32, 18x32, 25x40, Eagle 10x16, 20x36, Diamond 24x36". Cedar Rapids 10x20, 15x36, 20x36, 25x40. Farrell 18x20, 18x30, 14x36, 18x36, 36x48. Buchanan Type C 30x42, 36x42. Traylor 18x36, 24x36. Allis-Chalmers 30x18. Good Reads 10x30. Telsmith 18x32. Universal 18x24.
GYRATORY: Al-Chal 6, 7½, 8, 9, 10, 12, 16, 18, 20". Telsmith TY 4', 3' Gyrosphere
25B Kennedy Van Saun 12, 37½, 38, 49½"
ROLL: Cedar Rapids 40x20, Pioneer 40x22, 30x18, 54x24 triple roll; Telsmith 24x16. Universal 13x18
HAMMERMILL: Jeffrey Type B3 24x20, Type B 36x24, 36x36, 36x42, Eagle 24x34, Stedman 24x30, 36", 42". Cedar-Rapids 50-50, 30x33, 30x42.
BALL MILL: Hardinge conical 10'x48", 8'x48", 8'x36", complete, motors, Traylor 7'x33'.
TUBE MILLS: Smidth 6'6"x21', 5½x20'.
ROD MILL: Marcy 3'x8' center discharge, 8'x6', Jackson & Church 4'x10'.
AUTOCLAVES: J&C 6'6"x58' Quick Acting; 6'x50'
CONE: Symons 3', 4¼' standard head coarse bowl
KILNS: 4'x42', 5'x30', 6'x50'6", 6'4"x45', 11'x155' Vulcan 9x100, 10'6"x105', 8'x124', 6'x90', 6'x72'.
DRYERS: 6'x80', 6'x72', 5'x24', 4'6"x32', 5'6"x30', 6'x30', 5'x35', 6'x24', 6'x40'.
COMPER MILLS: A-C 7'x24', Patterson 7x18.
FEEDERS: Synstron F55 48x72", 48x60", Jeffrey 35x72". Telsmith 36"x14', Universal 36"x32'.

CRUSHING—WASHING—CLASSIFIER

Eagle Log Washer 48" x 30' Model BMD. New 1955. Used only 700 hours.
Pioneer Port. 10x24 jaw 24x16 roll compl. Diesel
C-R 2540 Prim. Port. Diesel
Pioneer Special 34, 10x24 Jaw 24x16 Roll. Diesel.
C-R Primary Port. 22x36 Jaw. Diesel.
Eagle 36x25" single screwspiral etc.
Diamond Wes-Con port. Primary 29"x36" crusher
C-R Port. Prim. 20x36" Diesel E. B.
Eagle BMC Log Washer 48"x30' GM Diesel
Eagle 24"x25' dbl. screw washer 15 HP motor

CONCRETE PLANTS AND EQUIPMENT

Noble CA 354, 4 compts. Complete Large cap. 350
Johnson 2 agg. bins 50 tons ea.-cement silo 1500 bbls.
Erie-Strayer 120 ton aggr. bin 880 bbl silo ground storage 1300 bbl silo
B-K P2100 3 compt. aggr. Heltzel 450 bbl cement
Erie-Strayer P3 3 compt. 195 tons aggr. bin; cement silo 675 bbls. cement interlocking
Erie Strayer port. New 1955, 40 yds. per hr. 600 bbl. cement silo
Johnson 400 yd 5 aggr. 1500 bbls. cement batch 6000 bbl. silo 2-2 yd mixers
Johnson automatic batch 10,000 bbls. cement storage 3-2 yd mixers; screening equipment.
Johnson TY 228 2 compt. agg. w/TY1320 cement unit
Erie—Strayer 2, 50 T. compts. 850 bbls. cement 750 bbl. silo.
Johnson TY-227 70 cu. yd. 105 ton 3 compt. aggr. TY168 batcher.
Knox BCPC 600 bbl cement silo
Knox BCPC 300 bbl cement bin
1 Comp. 200 yd. ag. bin, cement silo 3000
2 Koehring 56-S mixers.

DREDGES FOR SAND-GRAVEL

6" Diesel on 14'x36' hull
Jacott 14" x 12" Steel Hull 64' x 32' Diesel. Portable Diesel powered. Complete.
Amsco 12" suc. 10" Dis. Hull 24'x50' Diesel-Elec.
Ellicott 8" with cutter. Diesel Hull 48'x18'x3'6"
8" Hydraulic Diesel. On 32'x8' steel pontoons
6" portable Diesel complete with cutters, etc.

SCREENS

Tyler-Hummer 4'x10' 2 Deck
New Symons 3'x12' 5 HP. Elec. Motor.
Pioneer 5'x12' 3 deck spring suspension
Cedar Rapids 4'x12' dbl. deck 25 H.P. elec. motor
Pioneer 5'x12' 2 deck 20 HP elec. motor
C-R 4'x14' 2 deck 25 HP motor

RICHARD P. WALSH CO.
30 Church St. New York 7, N. Y.
CO 7-8723 Cable: RICHWALSH

FOR SALE

2—COMPRESSORS, Gardner Denver WBHIM, Vertical Two-Stage, Watercooled, Combination Radiator & Intercooler, Built in 75 HP 440 Volt Motor, 445 CFM. Controls included. Good operating condition.

1—LOADER, Joy Hard-Rock, Class 18HR-2. with 440 Volt Open-Type Motors and 27½ rear conveyor; 12 TPM. Good operating condition.

Inspection invited. *Will demonstrate.* *Prices advised on request.*

GEO. W. KERFORD QUARRY CO.
P.O. Box 468
Atchison, Kansas
Phone—1206

HEAVY EXCAVATION EQUIPMENT

DRAGLINES, SHOVELS, CRANES, DRILLS, TRUCKS

15-W Bucyrus Erie Elec. Drag, 215', 12 yd.
450-W Bucyrus Erie Diesel Drag, 165' with extra 10, 12, 13 and 14 yd. buckets.
9-W Bucyrus Erie Elec. Drag, 165', 10 yd.
9-W Bucyrus Erie Diesel Drag, 165', 12 yd.
7-W Bucyrus Erie Elec. Drag, 140', 7 yd.
7-W Bucyrus Erie Diesel Drag, 140', 7 yd.
7400 Marion Diesel Drag, 175', 13 yd.
625 Page Diesel Drag, 150', 10 yd.
621-S Page Diesel Drag, 125', 7 yd.
200-W Bucyrus Erie Diesel Drag, 125', 6 yd.
S-W Bucyrus Erie Diesel Drag, 100', 6 yd.
2400 Lima Dragline, 130', 5 yd.
4500 Manitowoc Drag, 120', 5 yd.
120-B Bucyrus Erie Elec. Drag, 115', 5 yd.
111-M Marion Drag, 100', 4 yd.
1601 Lima, 4 yd. Shovel/Drag
3900, 3500 & 3000 Manitowoc Cranes
5560 Marion 26 Yd. Elec. Shovel
5480 Marion 18 Yd. Elec. H. L. Shovel
151-M Marion 7 Yd. Elec. Shovel
170-B Bucyrus Erie 6½ Yd. Elec. Shovel
4161 Marion 6 Yd. Elec. Shovel
2400 Lima 4½ and 5½ Yd. H.L. Shovels
120-B Bucyrus Erie 4 Yd. Elec. Shovel
4500 Manitowoc 5 Yd. H.L. Shovel
1201 Lima 3½ Yd. Standard Shovel
111-M Marion Standard & H.L. Shovels
3500 Manitowoc Standard & H.L. Shovels
54-B Bucyrus Erie Standard & H.L. Shovels
Large selection of smaller Shovels & Draglines
Model T-650 Reich Heavy Truck Mounted Rotary and Down-The-Hole Drill
McCarthy & Compton Coal Auger Drills
Euclid Trucks, Truck Cranes, Dozers, Attachments

FRANK SWABB EQUIPMENT CO., INC.
313 Hazleton Nat'l Bank Bldg.
Hazleton, Pa. GLadstone 5-3658

FOR SALE

Unusual Jaw Crusher Buy—24" x 42" C./C. Birdsboro-Buchanan Type C with 36" x 12' Heavy Duty Rock Feeder. Crusher complete with 100 HP Westg. Slip Ring Motor, Feeder has 20 HP Falk Reducer & Motor. This equipment is all in Very Good Condition & is being replaced by larger unit. Crusher Jaws are about 80% new and all brgs. in very good condition. Crusher has automatic grease system, complete v-belt drive, all electrical controls, grids, boxes, etc. Price $27,500.00. Write Box 3904, Brighton Station, Rochester 10, N. Y.

FOR SALE OR RENT

2½ Yd. Manitowoc #3900 Crane-Dragline. New 1955. 100' Boom.
1½ Yd. Manitowoc #2000B Crane-Backhoe. New 1956.
75 Ton Whitcomb Diesel Elec. Loco. 500 HP Cat. New 1951.
44 Ton Gen. Elec. Diesel Elec. Loco.
40/50 Ton American Diesel Loco. Crane.
25 Ton Ind. BH. Diesel Loco. Crane
25 Ton Gen. Elec. Diesel Elec. Loco.
6 Yd. Bucyrus-Erie Elec. Shovel. 1955.
90 HP Lidgerwood 2D Diesel Hoist.

WHISLER EQUIPMENT CO.
1905 Railway Exchange Bldg., St. Louis 1, Mo.
CHestnut 1-4474

PLANTS: 2036 Univ. staty. CR Commander, CR2036, 2236 primaries. Pioneer 1020 Port.
CRUSHERS: 8x6, 1020, 1036, 1220, 1536, 2036, 2436, 3042, 4042, 4860, 4872 **JAW.** 9 & 12K Gates. 10 to 20" McCully. AC322R, 636, 846R. 28", 36". 16B, 25B Telsmith. 4' Traylor **GYR.** 2 & 3' Symons. 1842 agl, 5424 dbl Roll.
FEEDERS: 3x8 AW. 3x10 Telsmith, 30" Merrick
DRYERS: 3x30, 4x20, 6x25, 7½x70, 8x70, 10x78
200 KW, 300 KW Diesel **GEN. SETS**
Cat D13000, D17000, Murphy ME650 **DIESELS**
MILLS: Raymond 5047 Roll. Dixie 2424 non-clog, 3650 Hammer 5x17, 5x21 Tube
SCRUBBERS: 8'x48" Hardinge. Yuba 7x35'
10 Joy 75 CFM, IR600 Gyrollo. West. 750 CFM Two IR 2400 CFM PRE2 **COMPRESSORS**
SHOVELS: Marion 93M, 111M, 492, NW6, 80, 95. Link Belt- LS50, Speeder B5. Lima 94. Bay-city ⅝ yd. Unit 1020. ⅜ yd. Insley. P&H 955, 1055 Koehring 1005. Bucyrus 44B, 54B, 150B
CRANES: Link Belt HC70, WB2 Browning Wagon, Manitowoc 2000B, 20, 30, 60 ton Bridge

MID-CONTINENT EQUIPMENT CO. INC.
8321 Gannon St. Louis 32, Mo. Wydown 1-2826

LIQUIDATION

DON'T MISS THIS ONE! !

at Alpha Portland Cement Co.
Manheim, W. Va.

1—Vulcan 9'x100'x⅝" Rotary Kiln
6—Vulcan 6'6"x60'x½" Rotary Kilns
1—Ruggles Cole 5'x28'x⅜" Dryer
2—Mosser 4'x47'x5/16" Rotary Dryers
1—Traylor 8'x11' Steel Lined Ball Mill
2—Beth. Fdy. 7'x24' Compeb Mills 3 Compartment
2—Beth. Fdy. 5'x22' Tube Mills
3—Allis Chalmers 6K; 8K Gyratory Crushers
1—Non-clog 35"x50" Hammermill
10—Fuller Lehigh 42" Pulverizers
10—Bucket Elevators 45' to 90' C/C

STOCK ITEMS

5'x45' Standard Rotary Dryer
6'x25'; 6'x50' Louisville Rotary Dryers
7'x50'; 8'x60' Ruggles Cole Dryers
15"x8" to 24"x18" Jeffrey Hammermills
C3-30 Pennsylvania Hammermill
20"x6" Bacon Type B Jaw Crusher
BOILERS, COMPRESSORS, GENERATORS, TRANSFORMERS

Write for Catalogs

ROCK PRODUCTS EQPT.
Div. of HEAT & POWER CO., INC.
60 East 42nd St., New York 17, N. Y.
MU-7-5280

FOR SALE

225 ton Steel Storage Bin w/70 foot high Bucket Elevator and 60 foot long Flight Conveyor fully complete. Used but in good condition. Price and further information on request.

DALTON SUPPLY COMPANY
Box 366, Dalton, Pennsylvania

3—10'x78' Dryers—3654 Jaw Crusher 30" Merrick Weightometer—36" S.A. Feeder 106' long—48" x 120' Feeder conveyor—Syntron Screen Conv. 24" x 31'—Syntron F86 feeder—6' x 14' Vib. Feeders—60" x 300' & 150' Conv. 3620 Dixie Non Clog Moving Plate Hammermills Asphalt Plants—Hydrated Lime Plant—2'3'4' Symons & Telsmith Cones—66FC Tel. Cone—Port. 24" x 25' Eagle sgl Fine Screw other sizes. Jaw—Cone—Gyratory—Roll dbl & triple—Hammermills & Impact crushers—Ball—Rod Tube—Screening, Washing and Crushing Plants. Classifiers, Compressors, Conveyors, Cranes, Drills, Dump Cars, Dredges, Feeders, Hoists, Motors, Generators, Kilns, Dryers, Locomotives, Pumps, Screens, Shovels, Draglines, Transformers, Euclid Trucks.

STANLEY B. TROYER EQUIP. CO.
Box 97 Phone 500 Crosby, Minnesota

Acme Jaw Crusher 9" x 16"
Acme Jaw Crusher 14x26", Steel frame.
Farrel Lab. Jaw Crusher 6" x 2"
Farrel #12B Jaw Crusher 36" x 18"
New England Jaw Crusher 14" x 28"
McLanahan & Stone 24x30" Single Roll
Kennedy #25½-S Gyratory Crusher, 220 v.
Sturtevant #1 Rotary Crusher
Sturtevant #1½ Rotary Crusher
Iowa 25 Yd. Portable Crushing Plant.
Hardinge 6x12 Rod Mill
Allis-Chalmers 4x6 Ball Mill
Link-Belt 3x5 D.D. Screen U.P.
Reliance 4' x 10' Scalping Screen
Robins Gyrex 42" x 6' Scalping Screen
Seco 5' x 16' D.D. Vibrating Screen
Niagara 4' x 14' Single Deck Screen
Niagara 2½' x 12' Single Deck Screen
New Universal Screens in stock.
All Sizes Recond. Conveyor Idlers
All Sizes New & Used Conveyor Belt
Conveyor Truss Made to Order.
New Holland Plate Feeder 24" x 60"
F-4100 Syntron Feeder with controls.
Jeffrey Traylor #4 Vibr. Feeder w/contr.
1 to 3 Cu. Ft. Rotary Vane Feeders.
Link-Belt D12 Herringbone Reducer
25, 30, 40 and 50 H.P. Motors.
50 H.P. 100 R.P.M. Gear Motors.
Over 800 Gear Reducers in stock.
Over 250 Misc. Motor in stock.
Hilco Oil Reclaiming Units
2—Battery Locomotives 4 Ton, 24" gauge, Complete, M-G Sets.
6' x 32' Heatherington Dryer 50 H.P.
2—Dryers 5' x 50' Complete
4—Lancaster Mixers, EMG-4
Komarek-Greaves Briquetting Press 6000 lbs./hr. 50 H.P. Motor and 40 H.P. Feeder, Hopper, Jeffrey #4 Discharge Feeder w/Controls.

G. A. UNVERZAGT & SONS INC.
136 Coit St., Irvington, N. J., Essex 3-8105

JAW CRUSHERS

60"x48" to 6"x3"

New and used RELIABLE

"Farrel-Bacon" Jaw Crushers

BACON-PIETSCH CO., INC.
26 Park St., Montclair, N.J.
29 Washington Ave., Hamden, Conn.
Phone Montclair—Pi 6-1300

BEST BELT BUYS

Heavy duty quality, 2500-3000# cover tensile, 16-19# friction pull. Brand new, factory fresh, 3 weeks delivery.

4 ply 28 oz.		LIST	SELL
14"	1/8"x1/16"	$4.31	$2.42
16"	1/8"x1/16"	$4.86	$2.72
18"	1/8"x1/16"	$5.40	$3.02
18"	1/8"x1/16"	$5.69	$3.19
20"	1/8"x1/16"	$5.90	$3.32
24"	1/8"x1/16"	$6.95	$3.90
24"	1/8"x1/16" (5 ply)	$8.54	$4.78
4 ply 32 oz.			
24"	1/8"x1/16"	$7.79	$4.36
30"	1/8"x1/16"	$9.58	$5.36

Many other sizes. Samples on request.
Distributorships available.

PALTECH CO.
New Canaan, Conn. WO 6-4126

DEPENDABLE USED MACHINES

Lorain 20 ton truck crane powered by Waukesha 6MZA gasoline engine

Scout backhoe	Telsmith 5x14 d.d. screen	Cat. D-7 angle dozer
Agricat hi-lift	#614 Unit ½ yd. backhoe	Koehring 304, hoe, drag & clam
Vermeer 4T ditcher	Telsmith 5x16 d.d. screen	Bay City 25 gasoline dragline
#514 Unit ½ yd. backhoe	Telsmith 4x10 d.d. screen	Shovel front for Lorain 77B 1½ yd.
Bay City #25 ½ yd. hoe	P&H #150 ½ yd. dragline	#105 TMC Hopto for mounting on HD-

This equipment rebuilt in our modern plant by expert mechanics. Come see it!

10002 Southwest Highway **TRACTOR & EQUIPMENT CO.** **Oak Lawn, Illinois**

$2,000,000 LIQUIDATION BRIQUETTING PLANTS

4—Ruggles-Coles dryers, 104" x 70' x 3/8" shell.
2—Komarek-Greaves, briquetting presses, 75 HP, 25 tons per hour.
4—Komarek-Greaves vertical Fluxers (paddle mixers), 150 HP.
4—K-G Horiz. Fluxers, 50 HP.
4—K-G Pug Mills, 30" dia. x 14'4".
6—Tyler Screens, 4' x 8', 4' x 6'.
2—42" wide traveling-screen cooling conveyors, total of 950'.
6—Robinson Sawtooth Crushers.
2—Pa. Crusher #C-3-30 hammermills.
20—Welded Steel bins, cone bottom, from 15,000 gal. to 90,000 gal.
8—16", & 24" trough-belt conveyors, 100', 250', 500' long.
6—36" & 48" apron feeders, 8' long.
8—Bucket elevators, 62' and 90' c-c.

PERRY EQUIPMENT CORP.
1418 N. Sixth Street
PHILADELPHIA 22, PA.
Phone: POplar 3-3505

HEAT & POWER CO., INC.
60 E. 42nd Street
NEW YORK 17, N. Y.
Phone: MUrray Hill 7-5280

WANTED MARCH 1, 1960

50-60 ft. crane boom Rudimatic or similar tagline assembly, drum lagging and other parts, to convert 955A-P&H, Serial No. 15002, from shovel to crane. Would consider trading shovel front for crane boom assembly.

J. L. SHIELY COMPANY
1101 No. Snelling Ave., St. Paul 13, Minn.
Midway 6-8601

INGERSOLL-RAND DRILLMASTER

Mounted on International FD 190 Truck, 600 CFM Rotary Compressor. 3—48" Jacks; 100' 4" drill pipe. Excellent condition. Eastern Pennsylvania location.

FRANK SWABB EQUIPMENT CO., INC.
313 Hazleton National Bank Bldg.
Hazleton, Pa.—GLadstone 5-3658

PRICE REDUCED

Allis Chalmers Gyratory Crusher, Size 8-K (Gates type primary rock breaker). Was used to reduce 16" material to 2" product. We have a complete spare shaft and mandrel for this unit, plus some other spare parts. Act quickly! We must remove this unit within 90 days!

CHARLES LAURANCE, INC.
P. O. Box 689 Weehawken, N. J.
UNION 4-1010

WANTED

3' Symons Shorthead Crusher
4' Symons Shorthead Crusher
36" Telsmith F. C. Crusher
25 x 40 or 32 x 40 Austin Western or Cedar Rapids Jaw.

B. R. DeWitt, Inc.
Pavilion, New York

WANTED

For Manitowoc Model 4500 Dragline 42' Steel Top Boom Section. Part Number 50068. Quote Price.

INTERSTATE SAND & GRAVEL CO., INC.
Box 66, Covington, Indiana

FOR SALE

Davenport Locomotive, 45 Ton, Diesel Electric, Standard Gauge, Located near Kinder, Louisiana, available to Missouri Pacific Rails, condition good. Write: Box R-57, Rock Products, 79 W. Monroe, Chicago 3, Illinois

FOR SALE—Cedarapids Portable Crusher w/30"x10' screen, 24" belts, 24" reciprocating feeder, pneumatic tires, air brakes, w/either 1216 twin jaw crusher or 2033 hammermill, or both, Cat. Diesel Power, sold new this spring—priced right.

A. H. PUFFER COMPANY
201 N. Madison St.—WO 8-8881—Rockford, Ill.

BUSINESS OPPORTUNITIES

JUST MADE AVAILABLE

3—10' x 78' Dryers with 200 HP Motors
3654 Jaw Crusher with 150 HP Motor
30" Merrick Weightometer

Stanley B. Troyer Equip. Co.
Box 97, Crosby, Minnesota

14 x 24 Reliance Jaw Rebuilt
25½ Kennedy Gyratory Rebuilt
100 yd. 3 Compt. Concrete Plant complete, incl. 250 bbl. Aux. Cement & 900 bbl. Main, Screws, Elevator, Hopper, etc.
Erie Strayer 3 yrs. old.
Priced right for quick sale.

LOCKE EQUIP. CO. INC.
Box 212 R Sta., Kingston, N. Y.
FE 1-6201 or FE 1-6300

READY MIX CONCRETE PLANT FOR SALE

$500,000.00 ANNUAL GROSS AND STILL GROWING

LOCATED IN LAKE COUNTY, INDIANA

OWNER SEEKS RETIREMENT

WRITE FOR AN APPOINTMENT

Box R-58 c/o
Rock Products, 79 W. Monroe
Chicago 3, Illinois

LOCOMOTIVE FOR SALE

35 Ton Davenport 0-4-0- Mechanical Drive, Serial No. 2316, LeRoi RXIV 8 Cylinder Engine. Excellent Cond.

Interstate Sand & Gravel Co., Inc.
Covington, Indiana

FOR SALE

¾ yd. Heavy duty material handling bucket good condition—price $650.00
60 TPH chain bucket elevator new cond. $2000
1—Superlite Block Unloader $700.00
20 HP Fultan Boiler $500.00

THE McENERY COMPANY
13th and Myrtle Streets • Erie, Pennsylvania
Phone: GL-4-1531

FOR SALE

ONE ROTARY COOLER, 5'6" x 60', ½" Plate "Z" Bar Lifters on front 40'.
Complete with Reeves Varispeed motor drive and 10-h.p. motor.
Excellent Condition—Used One Year.

HYDRAULIC PRESS BRICK COMPANY
BROOKLYN, INDIANA—PHONE 26

Platform Lift Truck — Erickson — Power Steering—Pneumatic tires—Excellent condition—Good buy—$950.00—WI 5-2700

LUCISANO BROS.
Tullytown, Pa.

GANTRY CRANE

American Revolver Model 685, Electric 22 ton Cap., Traveling, 95' Boom

GEORGE M. MERIWETHER Incorporated
1712—7th Ave. No. FA 4-2456
Birmingham 4, Ala.

EQUIPMENT WANTED

MOTORS AND GENERATORS

All sizes, new and rebuilt. Starters, accessories, pulleys and repair parts. Gear motors, Falk Shaft mounted Speed Reducers, couplings and V-belt drives.

EXPERT REPAIR SERVICE

NUSSBAUM ELECTRIC COMPANY
220 E. Douglas Ave., Fort Wayne, Ind.

WANTED

Operating sand & gravel property in western U. S. Must be near growing community and capable of expansion. Also interested in west coast non metallics with growth possibilities. Reply 444 Foxen Drive, Santa Barbara, California.

For Sale by Owners

Ready Mix Business

Plant located West Central Illinois now in operation, state approved, all necessary equipment including bulk cement. Box R-62, Rock Products, 79 W. Monroe, Chicago 3, Illinois

CONSULTING ENGINEERS AND SERVICES

Quarries
Crushing Plants
Cement Plants
Storage Methods
Operating Costs

E. LEE HEIDENREICH JR.
CONSULTING ENGINEERS
75 Second Street
Newburgh, N.Y.
Phone JO 1-1828 (Code 914)

Operation
Plant Layout
Design
Appraisals
Construction

CORE DRILLING
--anywhere!
"We look into the earth"
PENNSYLVANIA DRILLING COMPANY
Pittsburgh 20, Pa.

EDMUND BURWELL ILYUS
Consulting Engineers
Automation—Materials Handling
Plant & Process Design
P.O. Box 1253 Roanoke, Va.

Core Drilling
Minerals Clays Limestone
Foundation Testing
Buildings Highways
THOMASVILLE DRILLING & TESTING CO., INC.
Thomasville, Pennsylvania.

This Size Ad Costs Only $10.25

WANTED HELP — POSITIONS

MANAGER
GYPSUM BOARD PLANT

A REMARKABLE OPPORTUNITY FOR THE MAN WHO CAN PROVE HE IS READY

THE LOCATION—The Rapidly Expanding West
THE COMPANY—Well Established & On the Move
THE OPPORTUNITY—Challenging & Rewarding

Requirements

1. Proven record of accomplishment in the supervision of a production activity in the gypsum industry.
2. Superior ability to get profitable results through the effective use of men, machines and materials.
3. College degree or equivalent with emphasis on engineering.
4. Age 30 - 42 years.

Write in confidence, giving experience and responsibilities held, earnings record, education, age and income expected.

Box R-71
Rock Products, 79 W. Monroe, Chicago 3, Illinois

GYPSUM QUALITY SUPERVISOR and ENGINEER-PRODUCTION TRAINEE

Gypsum plant in the Rocky Mountain area has two openings offering outstanding opportunities and living conditions. Quality Supervisor must have gypsum experience with college education. Applicants must have potential for advancement into higher levels of supervision. Write: Box R-72, Rock Products, 79 W. Monroe, Chicago 3, Ill.

Wanted: Superintendent

for Crushed Stone Plant and Quarry in Western New York State. Write full information to Box R-65, Rock Products, 79 W. Monroe, Chicago 3, Illinois.

INDEX TO WHERE TO BUY

RETARDED CHILDREN CAN BE HELPED

WANTED:
Plant Production Superintendent

Age: 25 to 33 years

Education: Graduate Engineer

Experience: 2 to 5 years in production, either staff or operating side. Experience should be in industry connected with moving of heavy materials either in processing or mining.

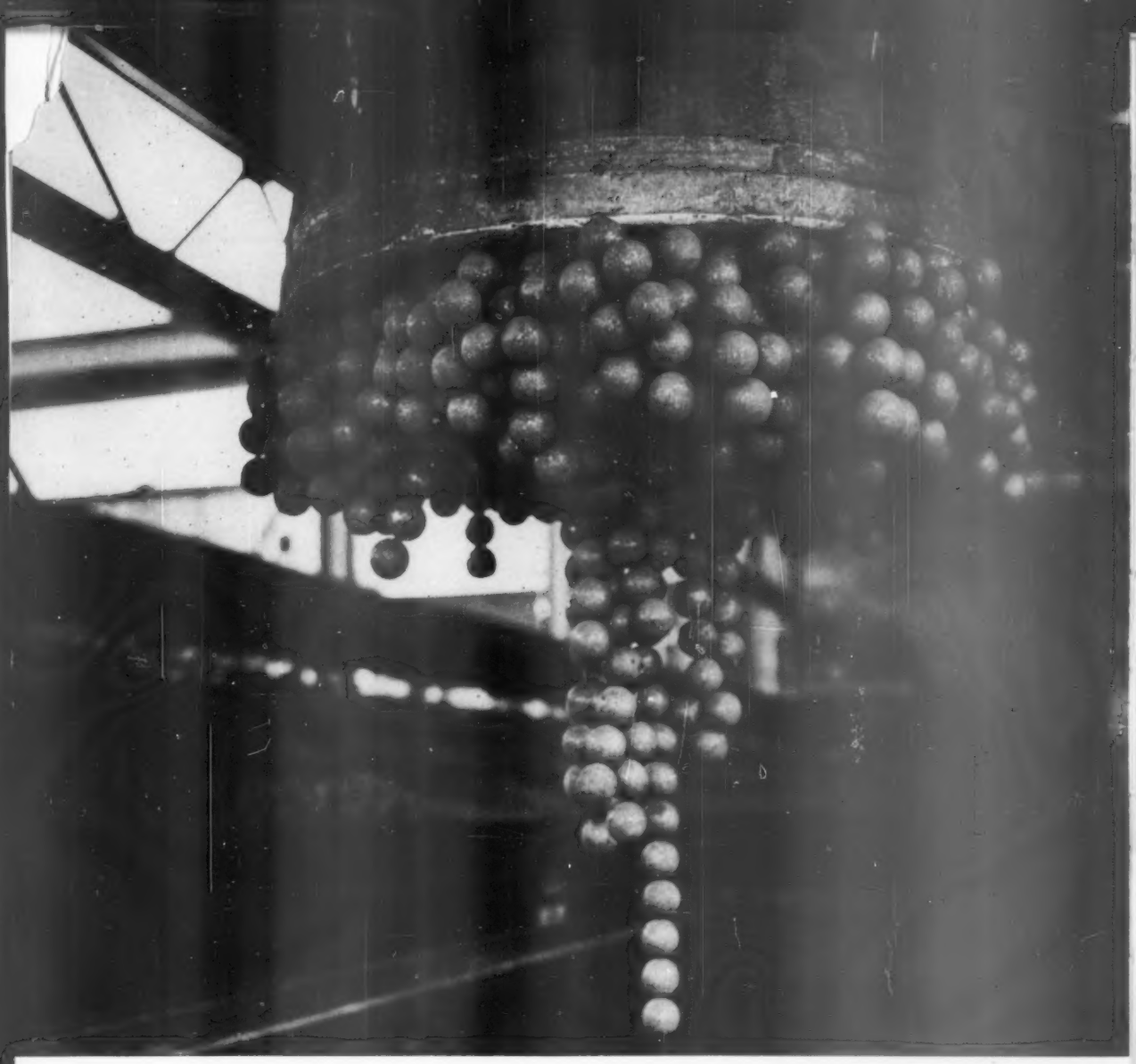
Salary: Commensurate with ability and experience in range of $7,500 to $10,000.

Send resume to Box R-69, Rock Products, 79 West Monroe Street, Chicago, Ill.

PLANT ENGINEER WANTED

Multi plant cement company needs engineer. Opportunity for training and advancement. Give full details on background. Replies confidential. Box R-13 Rock Products 79 West Monroe, Chicago 3, Ill.

INDEX TO DISPLAY ADVERTISERS



Need grinding balls in a hurry?

CONTACT UNITED STATES STEEL! If all of a sudden you find you're caught short on grinding balls, you can get them fast from United States Steel. For example, a plant in Indiana recently phoned our Indianapolis sales office and asked if we could deliver 20,000 pounds each of 1¼- and 2-inch diameter USS Carbon-Manganese Grinding Balls to them *in two days!*

We did. The grinding balls were packed in drums, shipped via truck, and arrived at the Indiana plant on the morning of the day they needed them.

Though most companies place orders for grinding balls two to three months in advance, there are always emergencies . . . and United States Steel is ready to help you when that emergency develops. A complete stock of USS Carbon-Manganese Steel and USS Alloy Steel Grinding Balls is maintained at all times.

We can ship grinding balls almost any way you like: In 100-pound capacity burlap bags; in 2,000-pound capacity steel drums; in semi-trailer or dump trucks; in gondola or box cars (loose or in containers); or you can send your own truck if you like. The next time you need grinding balls contact the United States Steel sales office nearest you, or write or call United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

USS is a registered trademark

USS

United States Steel Corporation—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Export Company

United States Steel

ROCK PRODUCTS INDEX

January-December 1959, Volume 62

(Continued on page 182)

WONDERWALL™
cuts bag breakage for Godchaux Sugar

Another major concern, The National Sugar Refining Company's Reserve Division, producers of Godchaux brand sugar at Reserve, La., is now achieving substantial reduction in breakage with WONDERWALL bags.

WONDERWALL, developed by West Virginia, is the remarkable multiwall bag made with the new Kraftsman Clupak* paper. This paper's patented, built-in "stretch" gives it far greater toughness than ordinary kraft.

Mr. Sedgwick Howard, Division General Manager of National Sugar, states:

"Bag breakage has been cut by 51.8% in a series of shipments of more than 600 cars. The addition of an asphalt laminate sheet in our WONDERWALL bag has greatly reduced sugar hardening."

The extra toughness of WONDERWALL really pays off —and it doesn't cost you a cent more; in many cases it actually *reduces bag expense.*

See how WONDERWALLS can cut your bag breakage, and very possibly also reduce your bag cost. Just write Multiwall Bag Division, West Virginia Pulp and Paper Company, 230 Park Avenue, New York 17, N. Y., or 1400 Annunciation Street, New Orleans 13, La.

**Clupak Inc.'s trademark for extensible paper manufactured under its authority.*

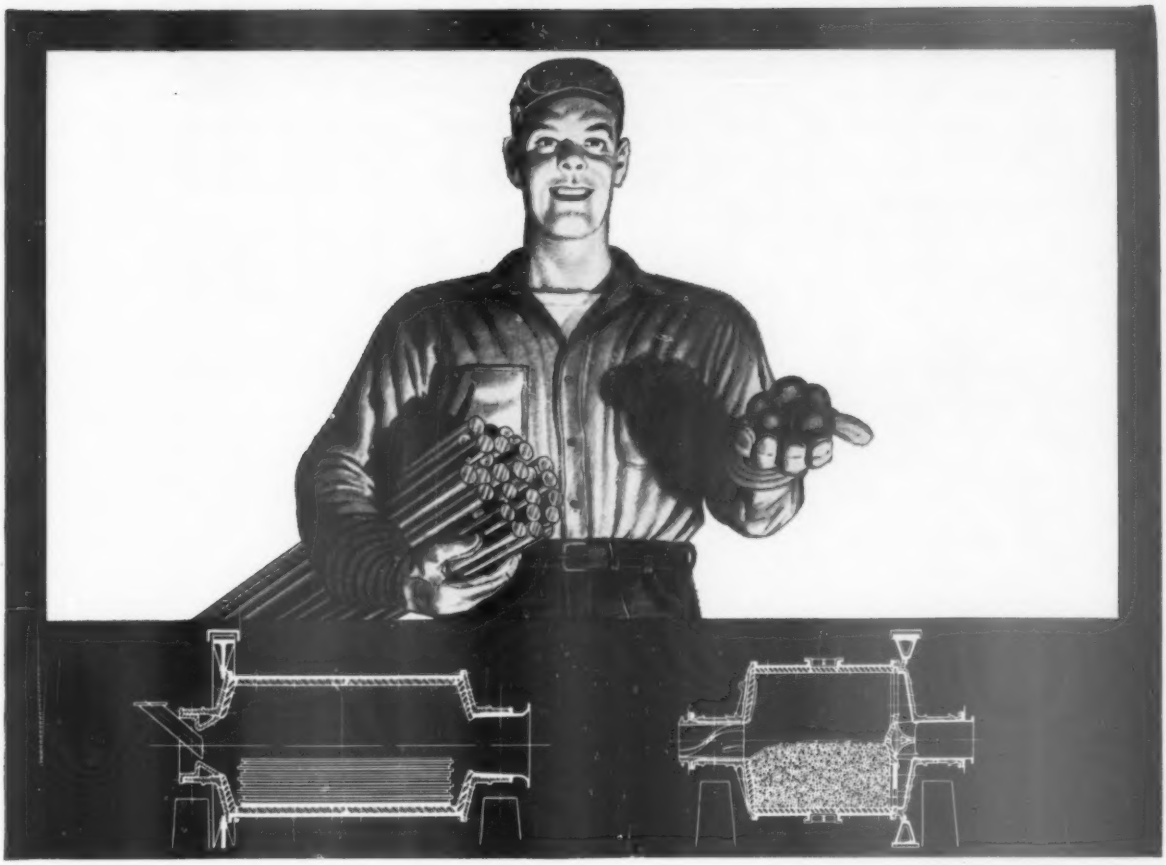
West Virginia Pulp and Paper

Enter 1278 on Reader Card

ROCK PRODUCTS INDEX

(Continued from page 180)

(Continued on page 184)



Increase grinding mill efficiency... with CF&I Grinding Media

The Image of CF&I helps assure increased output in grinding mill operations—through the use of long-wearing, tough CF&I Grinding Balls and Grinding Rods.

The special analysis steels used in these products give an ideal balance between hardness and toughness—thus affording optimum grinding ability plus maximum wearability.

CF&I GRINDING BALLS are hot-forged and carefully inspected throughout production and immediately before shipment to assure that they are free of surface pits, circumferential ridges or other surface imperfections. They have excellent resistance to both abrasion and impact, and operate economically in either high or low speed mills. Available in diameters from ¾" to 5".

CF&I GRINDING RODS are hot-rolled of a special long-wearing steel which minimizes both bending and premature breakage. All rod ends are square cut and rods are of proper length to fit the mill in which they will operate. All rods are machine straightened to assure maximum line contact between the rods for the full length of the mill. These properties help facilitate rod line-up in the mill and eliminate tangling of the charge. Available in ½" increment sizes from 1½" to 4" in diameter and in various lengths.

For complete information and service on all CF&I Mining Products, contact the nearest CF&I sales representative.

OTHER CF&I STEEL PRODUCTS FOR THE CEMENT INDUSTRY
CF&I Mine Rail and Accessories • CF&I Rock Bolts and Realock Metallic Fabric
CF&I Industrial Screens • CF&I-Wickwire Rope • CF&I Grader Blades

CF&I STEEL

MINING PRODUCTS
THE COLORADO FUEL AND IRON CORPORATION

In the West: **THE COLORADO FUEL AND IRON CORPORATION**—Albuquerque · Amarillo · Billings · Boise · Butte · Denver · El Paso · Farmington (N. M.) · Ft. Worth · Houston · Kansas City · Lincoln · Los Angeles · Oakland · Oklahoma City · Phoenix · Portland · Pueblo · Salt Lake City · San Francisco · San Leandro · Seattle · Spokane · Wichita
In the East: **WICKWIRE SPENCER STEEL DIVISION**—Atlanta · Boston · Buffalo · Chicago · Detroit · New Orleans · New York · Philadelphia 7074-A

Enter 1262 on Reader Card

ROCK PRODUCTS INDEX

(Continued from page 182)

N

O

P

Q

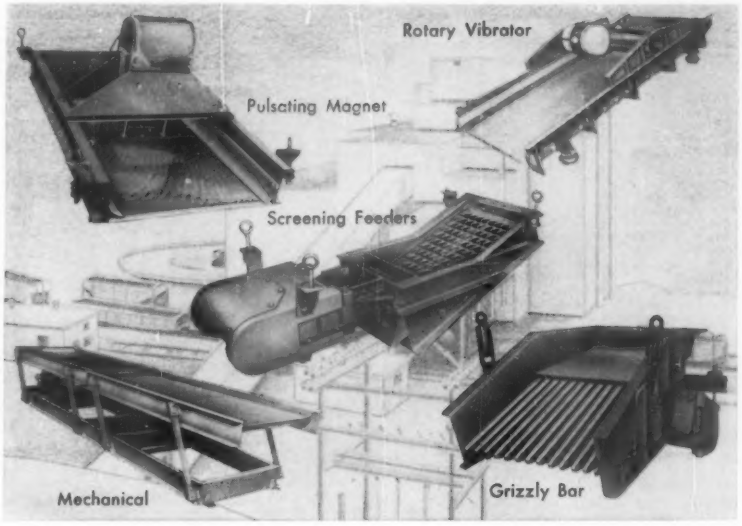
R

S

(Continued on page 186)

SYNTRON

VIBRATING SCREENS



for efficient, dependable low cost scalping, sizing, dewatering or fine screening

SYNTRON builds a vibrating screen for every screening job from heavy duty scalping of rock to fine quality control screening of aggregates.

SYNTRON Vibrating Screens are built in a variety of styles—one, two or three deck models with drive units designed for each particular screen. Available in sizes ranging from 2 feet wide x 5 feet long to 6 feet wide x 14 feet long plus the 4 feet wide x 20 feet long conveyor screen.

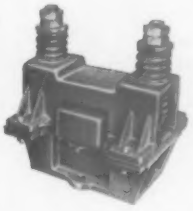
SYNTRON Screens provide uniform vibration, eliminating dead spots. Constant full screen efficiency provides more effective separation and higher capacity.

SYNTRON Screens combine efficiency, dependability and low maintenance to give better separation, greater tonnage at lower cost.

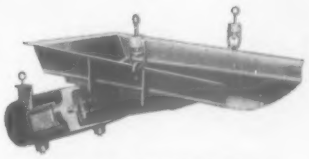
SYNTRON Screens are compact, easy to install, easy to maintain.

Write for complete information on all SYNTRON Screens

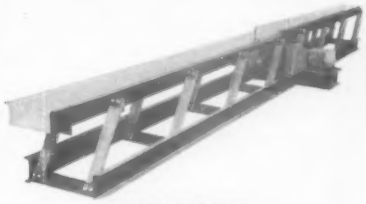
Other SYNTRON Equipment of proven dependable Quality



BIN VIBRATORS



VIBRATORY FEEDERS



MECHANICAL VIBRATING CONVEYORS

ROTARY VIBRATOR CAR SHAKERS

VIBRATORY PACKERS & JOLTERS

SYNTRON COMPANY
450 Lexington Ave. Homer City, Penna.

Enter 1303 on Reader Card

ROCK PRODUCTS INDEX

(Continued from page 184)

T

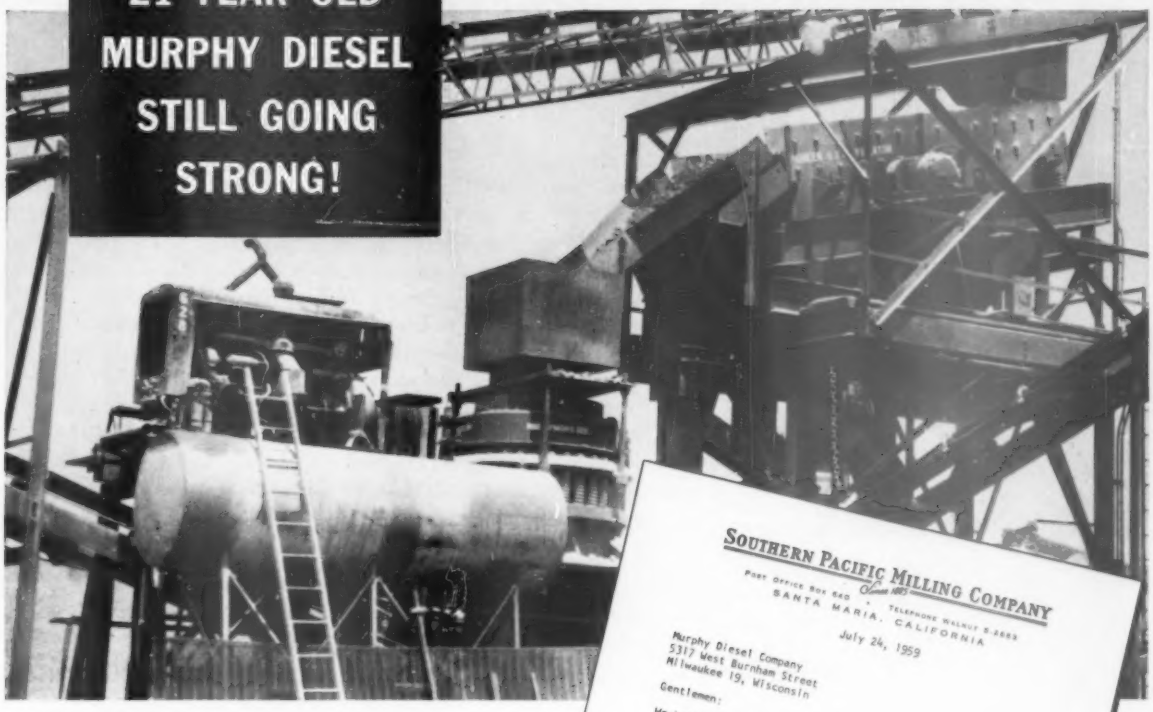
U-V

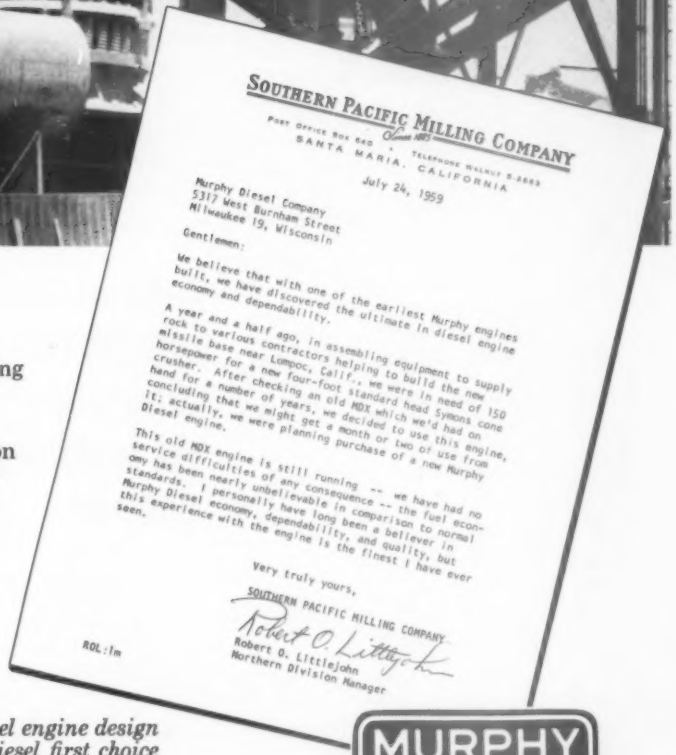
W-X-Y-Z

A word about your *Rock Products* index . . .

This index has been prepared for your convenience in locating articles appearing in ROCK PRODUCTS during 1959. You will find it useful. Articles are indexed by subject and author, and are cross-indexed under as many major topics as are contained in them—these include processes, equipment, personalities, forecasts, plant and company names, type of product, ideas and methods. You will also find Rocky's Notes and Editor's Page indexed in the above manner.

21 YEAR OLD MURPHY DIESEL STILL GOING STRONG!





SOUTHERN PACIFIC MILLING COMPANY

POST OFFICE BOX 840 · TELEPHONE WALNUT 5-2663
SANTA MARIA, CALIFORNIA

July 24, 1959

Murphy Diesel Company
5317 West Burnham Street
Milwaukee 19, Wisconsin

Gentlemen:

We believe that with one of the earliest Murphy engines built, we have discovered the ultimate in diesel engine economy and dependability.

A year and a half ago, in assembling equipment to supply rock to various contractors helping to build the new missile base near Lompoc, Calif., we were in need of 150 horsepower for a new four-foot standard head Symons cone crusher. After checking an old MDX which we'd had on hand for a number of years, we decided to use this engine, concluding that we might get a month or two of use from it; actually, we were planning purchase of a new Murphy Diesel engine.

This old MDX engine is still running -- we have had no service difficulties of any consequence -- the fuel economy has been nearly unbelievable in comparison to normal standards. I personally have long been a believer in Murphy Diesel economy, dependability, and quality, but this experience with the engine is the finest I have ever seen.

Very truly yours,

SOUTHERN PACIFIC MILLING COMPANY

Robert O. Littlejohn

Robert O. Littlejohn
Northern Division Manager

ROL:lm

Proof that Murphy Diesel saves you money

This early model Murphy is still earning its way! According to the owner, it is operating efficiently with fuel economy that is "nearly unbelievable in comparison to normal standards." The experience of Southern Pacific Milling Company with this 21-year-old Murphy is the best evidence that operators who want "the ultimate in Diesel engine economy and dependability" are wise to choose Murphy.

Twenty-one years of improvement in diesel engine design and construction make today's Murphy Diesel first choice for always-dependable, low-cost operation.

MURPHY DIESEL

MURPHY DIESEL COMPANY

5315 W. Burnham St., Milwaukee, Wisconsin

SALES . . . PARTS . . . SERVICE

Throughout the Nation

409RO

HEAVY-DUTY POWER FOR CONSTRUCTION

Murphy Diesel engines and power units are available in sizes from 96 to 264 H.P. with engine speeds of 1200 and 1400 rpm. "Packaged" generating units are available with capacities ranging from 64 to 165 K.W.

Enter 1276 on Reader Card

ORDER YOUR COPY OF THE J. A. Nicholson Book

READY MIXED CONCRETE TODAY

Only $5.00 a copy

James A. Nicholson, for many years the President of the Nicholson Concrete Company of Toledo, Ohio, was named President of The Toledo Plaster & Supply Company, Toledo's oldest building material firm in August, 1959.

Jim (as he is known in the industry) Nicholson is a graduate lawyer and first entered the concrete business in 1936 after serving six years as head football coach of the University of Toledo. Starting from scratch, after taking over a defunct building supply company, he set out to develop a ready-mixed concrete business without previous knowledge. Today he is recognized as one of the best informed men in the industry.

He is a past president of the Ohio Ready Mixed Concrete Association and former director of the National Ready Mixed Concrete Association. Mr. Nicholson has also spoken on a number of industry problems at different concrete quality schools held throughout the country.

Nicholson Concrete Company was incorporated in 1950, the business having been operated and built up previously as an individual enterprise. Four central mixing plants serve the Toledo area, and the delivery fleet consists of approximately 45 mixer trucks. The company employs 75 men and the volume of sales in ready-mixed concrete is currently at the rate of $2,000,000 annually.

ROCK PRODUCTS
79 West Monroe Street
Chicago 3, Illinois
Maclean-Hunter Publishing Corporation

THERE ARE apparently but two ways to learn the intricacies of any business or profession. One is in the hard school of individual personal experience, which is often costly and unnecessarily discouraging. The other is a thorough understanding and intelligent use of the experience of others. When a qualified author, such as Mr. Nicholson, discusses his experience, including failures and mistakes, in an analytical and philosophical mood, the reader can profit from the recorded knowledge of another. Having once absorbed the breadth and completeness of the contents of this book, the reader should be well protected against errors of judgment that have proved so costly to many a new enterpriser. READY MIXED CONCRETE is a compilation of a series of articles on the ready-mixed concrete industry that have been published serially in CONCRETE PRODUCTS during the last several years. Now being offered for the first time in book form it is a veritable encyclopedia on ready-mixed concrete.

WE RECOMMEND Ready Mixed Concrete to all manufacturers, executives and salesmen who are interested in the production and marketing of building supply products.

The book sells for $5.00 per copy.

Each of the ten sections listed below consist of from three to eleven chapters in which the various subjects are comprehensively treated.

- Operation Fundamentals
- Special Operation Consideration
- The Story of the Ready-Mixed Concrete Industry
- Quality Problems and Importance of Good Practices
- Dealing with Customers
- Delivery Control Problems
- Handling Labor Problems
- Merchandising Ready-Mixed Concrete
- Preventive Maintenance in the Ready-Mixed Concrete Industry
- Business Office Operations

PLEASE ENCLOSE REMITTANCE WITH ORDER

RP-12

ROCK PRODUCTS
79 West Monroe Street, Chicago 3, Illinois

Please send _____ copies of READY MIXED CONCRETE for which I enclose $_____ ($5.00 per copy).

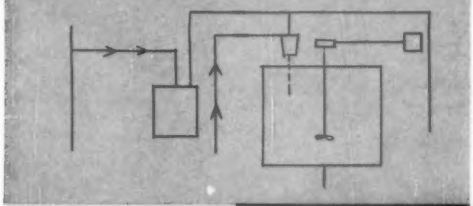
NAME _____

STREET _____

CITY _____ STATE _____ ZONE ____

IT PAYS TO ENGINEER YOUR PLANT!

to get the ***most*** *from your plant investment dollar*

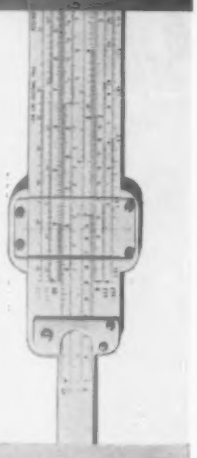


Sure, *you* can design and develop your own plant . . . *BUT* the question is, can you afford the time to search for the right, most profitable combination of plant development, equipment and processes to do the job?

You can hire the complete WKE Staff and with it bring to your organization complete experience and knowledge of materials, methods, labor, equipment, sources of supply—and management of endless factors.

You'll have the benefit of knowledge and experience gained in designing, specifying and engineering for dozens of other projects. A full staff of specialist engineers—design, process, civil, structural, mechanical, electrical, piping—will be at your service to see that you get full value from every dollar spent.

Contact a WKE office today. The WKE record of design and engineering experience will work profitably on your team.



DESIGN AND ENGINEERING

WESTERN-KNAPP ENGINEERING CO.

SAN FRANCISCO	NEW YORK	CHICAGO	HIBBING
680 FIFTH ST	50 CHURCH ST	431 S. DEARBORN ST	9133 FOURTH AVE., EAST
EXbrook 7-2375	WORTH 4-4858	HARRISON 7-0391	AMHERST 2-1093

WKE®

Enter 1226 on Reader Card

In 1955, Kaiser Unitab Kiln Liners introduced cement producers to the savings in installation time and the increased liner life made possible by factory-bonded shims and spacers.

Today, Unitab Liners are still setting records unmatched by any other kiln liner! Such as:

". . . installed 30 feet of Unitab Liners in 15 hours—as compared to 23 hours for (competitor) . . ."

". . . now have 584 days on Unitab Lining in No. 2 kiln—no hot spots."

Why this continued superiority?

First, the Unitab design assures fast installation . . . with correct placement of liner, shim and spacer all at one time. The cardboard spacer gives correct allowance for longitudinal expansion, and the shim bonding adhesive gives correct allowance for circumferential expansion. The portion of the shim overlapping the hot face melts during production start-up, quickly welds clinker particles into a tenacious coating. Gap between shim and shell acts as heat buffer.

Second, the Unitab brick assures long-life performance. This Kaiser Periclase Chrome brick is designed—and proved in kiln service—to be dimensionally stable, and to give high resistance to spalling and chemical attack by hot clinker.

If you aren't already using Kaiser Unitab Kiln Liners, let your Kaiser Refractories representative show you their time-saving, production-adding advantages. And ask to see the 30-minute color movie, "Progress In Modern Basic Refractories."

Call or write Kaiser Refractories & Chemicals Division, Dept. C9541, Kaiser Aluminum & Chemical Sales, Inc., at any of the Division Offices listed below:

PITTSBURGH 22, PA. . . . 3 Gateway Center
MEXICO, MISSOURI . . . Mex-R-Co Building
OAKLAND 12, CALIF. . . . 1924 Broadway

KAISER REFRACTORIES

*U. S. Patent No. 2629577. Foreign patents applied for.

KAISER UNITAB KILN LINER

INDUSTRY'S FIRST UNITIZED KILN LINER AND STILL THE INDUSTRY'S BEST!